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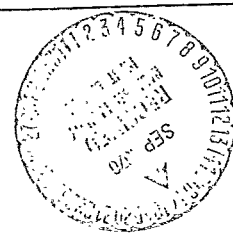

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Final Report

THEORETICAL ANALYSIS OF DIPOLE ANTENNA CHARACTERISTICS ON THE RAE SATELLITE

Part 1

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1. INTRODUCTION

The purpose of the work described in this report was to calculate the expected radiation characteristics of a dipole antenna mounted on the Radio Astronomy Explorer (RAE) Satellite. The principal other elements affecting the performance of the dipole are a pair of much longer V-antennas mounted in a plane containing the dipole, and a libration damper of overall extent intermediate between those of the dipole and the combined V-antennas, mounted at a skew angle to that plane.

The TCI Wire Antenna Scattering Program WIRA, used in performing the calculations, represents an antenna as an assemblage of straight wire segments. In the present instance, the shortest wavelength to be considered is about 107 ft. This compares with overall element lengths ranging from 123 ft. for the dipole to 1503 ft. for the V-antennas, and a spacecraft diameter of only 3 ft. The behavior of the radiating system will clearly be dominated by the long elements. The error inherent in representing the spherical body of the satellite by means of a wire cage would be greater than that resulting from simply ignoring it. Consequently, for most purposes the configuration has been idealized as consisting of the long members only, meeting at a point at the origin of coordinates, where electrical connections are made.

The relative orientations of the several elements are shown in Fig. 1, and their internal electrical connections for analysis in Fig. 2. Both full and partial extensions of the V-antennas are considered, with correspondingly different damper lengths. Each branch of the V-antennas is terminated in a resistance-capacitance combination, and is resistively loaded at a point a fixed distance from the outer end. The libration damper is insulated from the body of the spacecraft, being coupled only capacitively to it.

The symmetry of the configuration is such that, with respect to excitation of the dipole, the X-Z plane, containing the dipole and the libration damper, can be treated as a magnetic wall plane of symmetry, and advantage is taken of this fact in the computation.

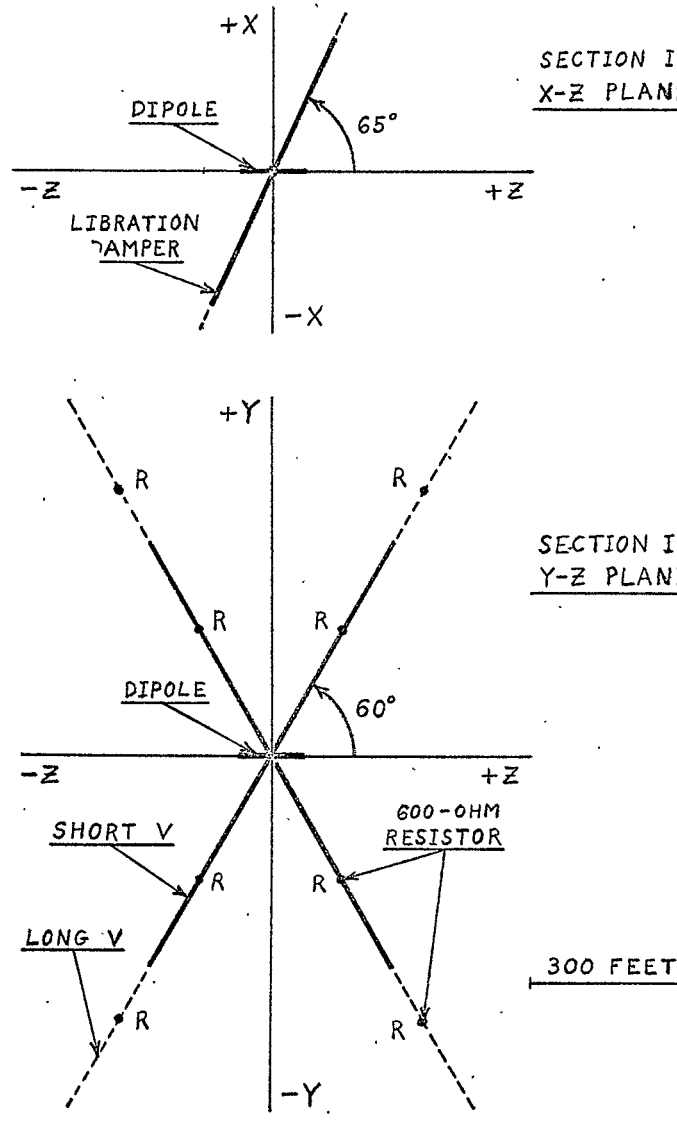


Fig. 1 Geometry of Dipole on Satellite.

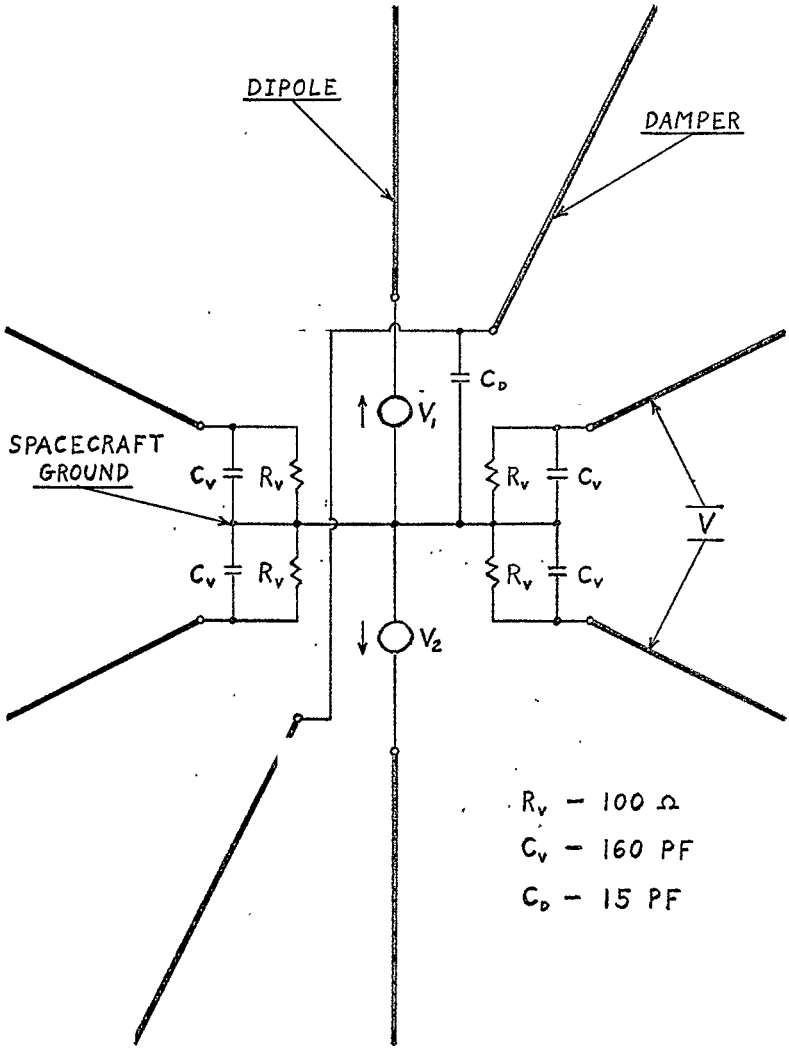


Fig. 2 Internal Electrical Connections of Dipole on Satellite.

2. DIPOLE RADIATION CHARACTERISTICS

2.1 Balanced and Unbalanced Modes

All possible modes of excitation of the dipole can be represented as superpositions of two basic modes in varying proportions. These are the balanced, or push-pull, mode ($V_2 = -V_1$ in Fig. 2) and the unbalanced, or push-push mode ($V_2 = V_1$). In general, for a configuration having the degree of symmetry of the RAE Satellite, a perfectly balanced receiver can respond only to the balanced mode, while a perfectly unbalanced receiver responds only to the unbalanced mode. Any departure from the ideal in either type of receiver will result in a response to the undesired mode as well as to the desired one. In the present case, it is the balanced mode which is desired, and the unbalanced mode which is to be rejected. The effects of various types of receiver imbalance will be examined at some length in a later section.

2.2 Current Distribution

The current distributions on the dipole, V-antenna, and libration damper have been calculated at 17 frequencies for the long-V and short-V configurations in both balanced and unbalanced modes. Copies of the actual computer listings are shown in Appendix A, accompanied by a discussion of their proper interpretation.

Certain remarks on the symmetry of the current distribution are in order. For the purposes of this discussion, let the positive (or reference) direction for the

current on each member be outward from the origin. Then in any excitation mode of the dipole, the currents on the pair of V-antenna arms lying on the same side of the X-Y plane are always equal. In the balanced mode, the currents on one such pair of members are 180° out of phase with those on the other pair, the currents on the two halves of the dipole are 180° out of phase, and the currents on the two halves of the libration damper are 180° out of phase. In the unbalanced mode, the currents on all four V-antenna arms are equal, those on the two halves of the dipole are equal, and those on the two halves of the libration damper are also equal.

2.3 Dipole Input Impedance

The resistive and reactive components of the antenna input impedance are plotted as functions of frequency in Figs. 3 and 4. The values given are those corresponding to one half of the dipole, i.e., the impedance seen by one of the generators in Fig. 2.

The program calculates the input impedance by dividing the applied voltage by the calculated current at the feed point. At the lower frequencies, the reactive component of the impedance is of the order of thousands of ohms, as compared with a resistance of only a few ohms. Under these circumstances, an inaccuracy of but one degree in the phase of the input current can cause an error of the order of 100 ohms in the input resistance calculated in this way, even though the reactance is still highly accurate. Fortunately,

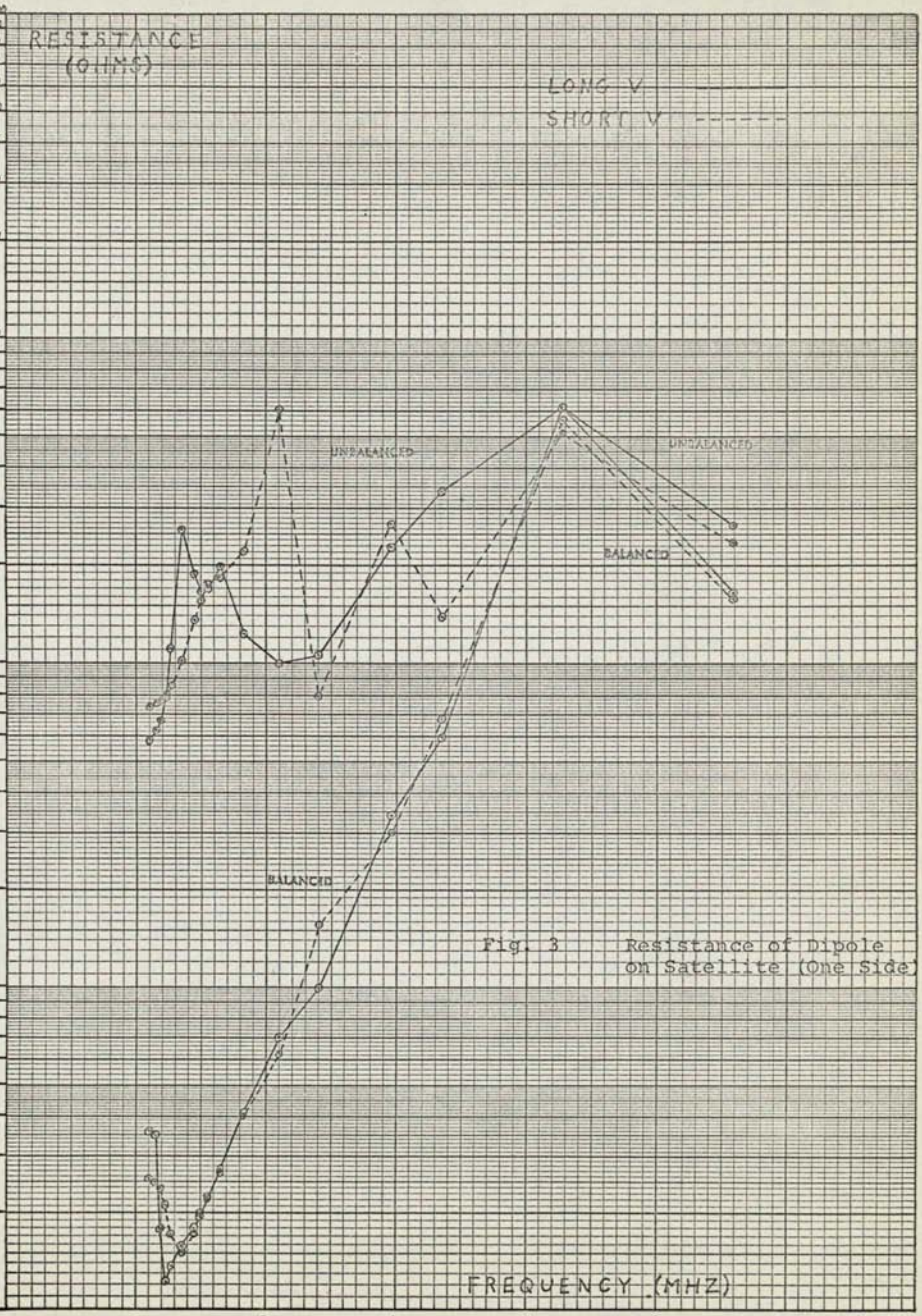


Fig. 3 Resistance of Dipole on Satellite (One Side)

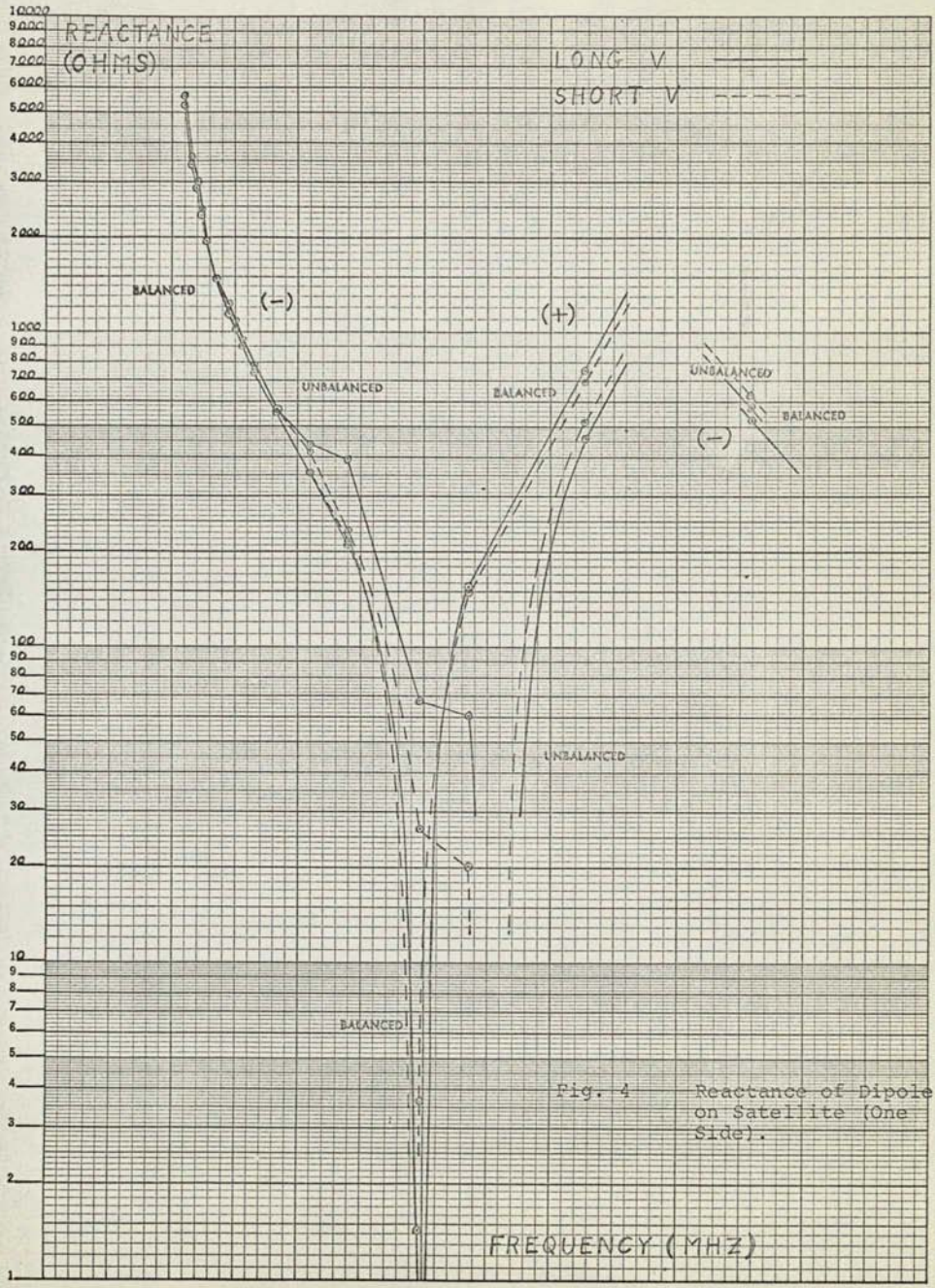
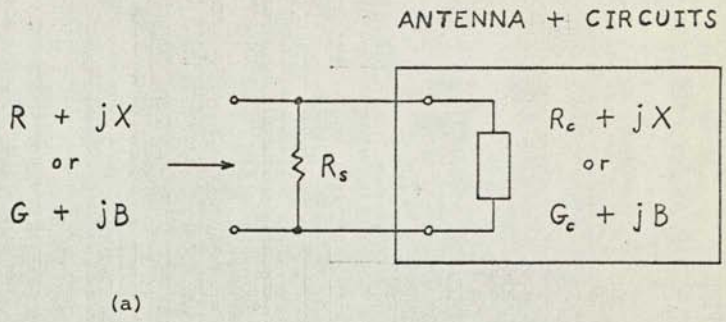


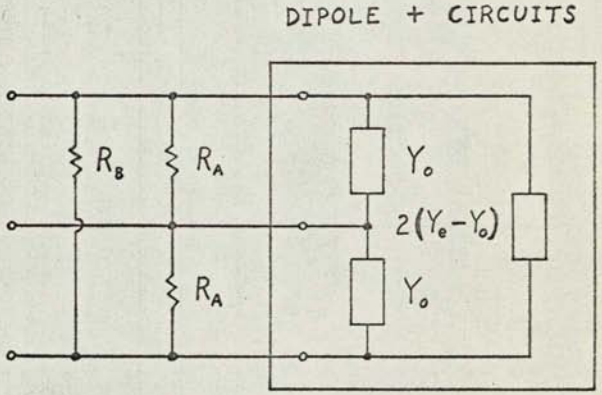
Fig. 4 Reactance of Dipole on Satellite (One Side).

the program performs other functions which make possible an independent determination of the resistance. First, the circuit losses are calculated from the currents and the lumped circuit parameters. Minor phase inaccuracies in the currents have negligible effect upon these losses, so they can be taken as correct. Second, if patterns representing an adequate sampling of the solid angle into which the antenna radiates are calculated, the program performs an integration on the radiated power to determine the average gain. This integration is based on the actual radiated field, which comes from the currents, and is therefore also correct. The determination of the average gain, however, entails division by the input power obtained from the erroneous input resistance. This additional information makes possible the calculation of the correct input power, and consequently the correct input resistance.

This correction on the input resistance was applied at frequencies of 2.2 MHz and below, where the dipole can be considered to be electrically short. In order to understand the correction, refer to Fig. 5(a), depicting an antenna and its associated passive circuitry as a black box having a certain input impedance R_c+jX or input admittance G_c+jB. In the present instance R_c and G_c are relatively so small that they are inaccurately computed, and the problem is to choose a shunting resistor R_s, which may be either positive or negative, such that the resulting input quantities $R+jX$ and $G+jB$



(a)



(b)

Fig. 5 Correction of Antenna Input Resistance at Low Frequency

are correct. Now the program calculates the network power loss P_L correctly. When the proper type of pattern is chosen, it also calculates the total radiated power P_R correctly, but the value printed out comes from a separate computation involving the input resistance. However, the average gain, computed from

$$\bar{G} = \frac{P_R}{|G_c||V|^2} \quad , \tag{1}$$

where V is the applied voltage, is shown. Since this contains the erroneous G_c, it is also incorrect. The correct input power P_{in} must satisfy the relations

$$P_{in} = P_L + P_R \tag{2}$$

and

$$P_{in} = G\,|V|^2. \tag{3}$$

Combining Eqs. (1), (2), and (3), one obtains

$$G = \bar{G}\,|G_c| + \frac{P_L}{|V|^2} \quad . \tag{4}$$

It then follows that

$$\frac{1}{R_S} = G - G_c = \bar{G}\,|G_c| - G_c + \frac{P_L}{|V|^2} \quad . \tag{5}$$

An alternative form of Eq. (5), valid because $G_o \ll B$, is

$$\frac{1}{R_S} = \frac{\overline{G}|R_o| - R_o}{X^2} + \frac{P_L}{|V|^2} \quad . \tag{6}$$

Figure 5(b) shows the corresponding configuration for the satellite dipole, which must be represented as a three-terminal network. The corrective resistors R_A and R_B are related to those calculated from Eq. (5) for the balanced and unbalanced mode (using $P_L/2$) as follows:

$$\frac{1}{R_A} = \left(\frac{1}{R_S}\right)_o \quad . \tag{7}$$

$$\frac{1}{R_B} = \frac{1}{2}\left[\left(\frac{1}{R_S}\right)_e - \left(\frac{1}{R_S}\right)_o\right] . \tag{8}$$

Here, and in all that follows, e represents the even (balanced) mode and o the odd (unbalanced) mode.

2.4 Gain and Efficiency

Radiation patterns in the three principal planes are shown in Appendix B, along with explanatory remarks.

The uncorrected gain values obtained at the lower frequencies would be in error by the same constant factor as is the average gain $\overline{G}$, and for the same reason. However, the principal-plane gain (patterns) was calculated with the corrective resistors in place, and therefore has the right set of values.

The power budget printed out by the program consists of values for the input power, radiated power, wire loss, network loss, and efficiency. To recapitulate, before correction only the wire loss (in this case zero) and the network loss are correct. In addition, the input impedance and gain values are incorrect. When the corrective resistors are placed in the circuit, their power dissipation is lumped by the program with the network loss, rather than with the radiated power as one would wish. Consequently, after correction only the input power and the wire loss are correct in the power budget. However, the input impedance and gain are now correct.

Since the efficiency printed out is still incorrect, it must be calculated separately. This can be done using the relation

$$\eta = 1 - \frac{P_L}{P_{in}} \qquad (9)$$

where P_L is taken from the uncorrected case and P_{in} from the corrected case. The values of efficiency, corrected where necessary, are plotted as functions of frequency in Fig. 6.

2.5 Dipole Alone

Up to this point, the spacecraft body has been neglected in the calculations. When the V-antennas and libration damper are removed, however, there is then no way to

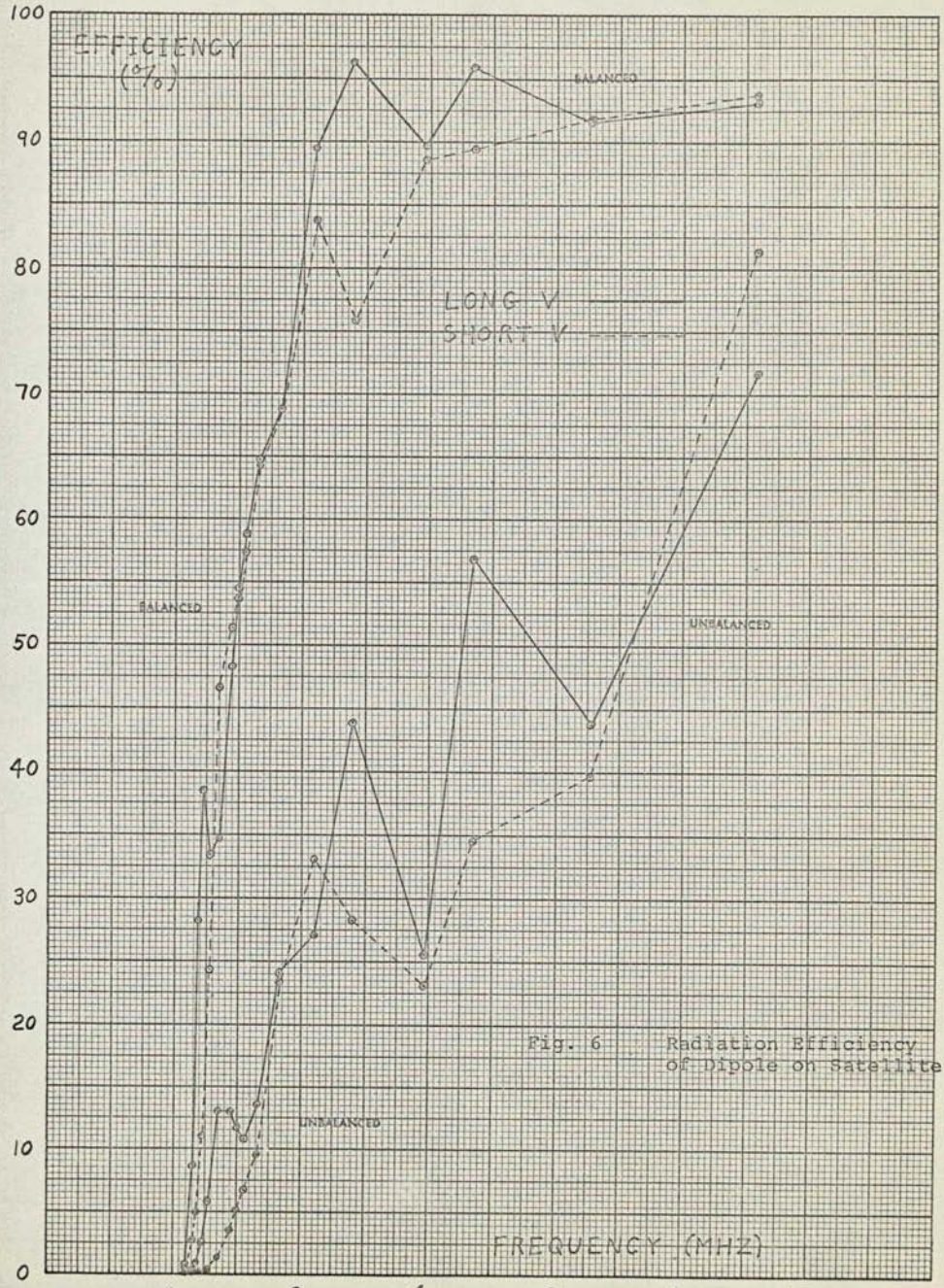


Fig. 6 Radiation Efficiency of Dipole on Satellite.

excite the unbalanced mode at all unless some representation of the free-space capacitance of the craft is retained. This has been accomplished by means of a short conductor, connected to the common point and oriented along the Y-axis, having the same free-space capacitance as the spherical hull. This conductor has a length of 6.9 feet and a diameter of 1.66 inch, representing a convenient, but not unique, choice of the parameters. The geometry is shown in Fig. 7.

The balanced mode of this configuration is identical with that of a simple dipole. Because of the small electrical size of the dipole at the lower frequencies, as well as the lack of network losses, all electrical properties of both modes remain constant over this range with the exception of the impedance and the magnitude of the current. The reactance varies approximately inversely with the first power of frequency. The resistance, on the other hand, varies directly with the square of frequency in the balanced mode and with the fourth power in the unbalanced mode. Consequently, the patterns and current distributions have been calculated only from the upper end of the lower range up. The resistance and reactance are plotted in Figs. 8 and 9. The current distributions are shown in Appendix C, and patterns in Appendix D. The efficiency is, of course, always 100%.

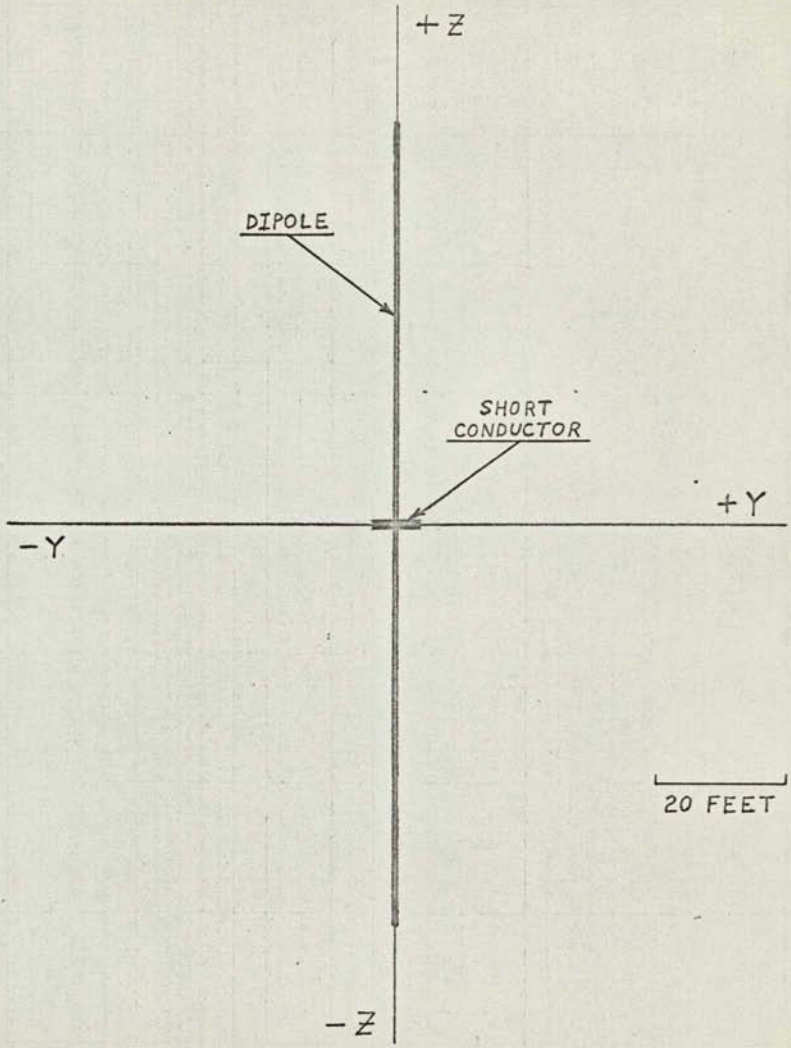


Fig. 7 Geometry of Configuration Representing Dipole Alone on Satellite

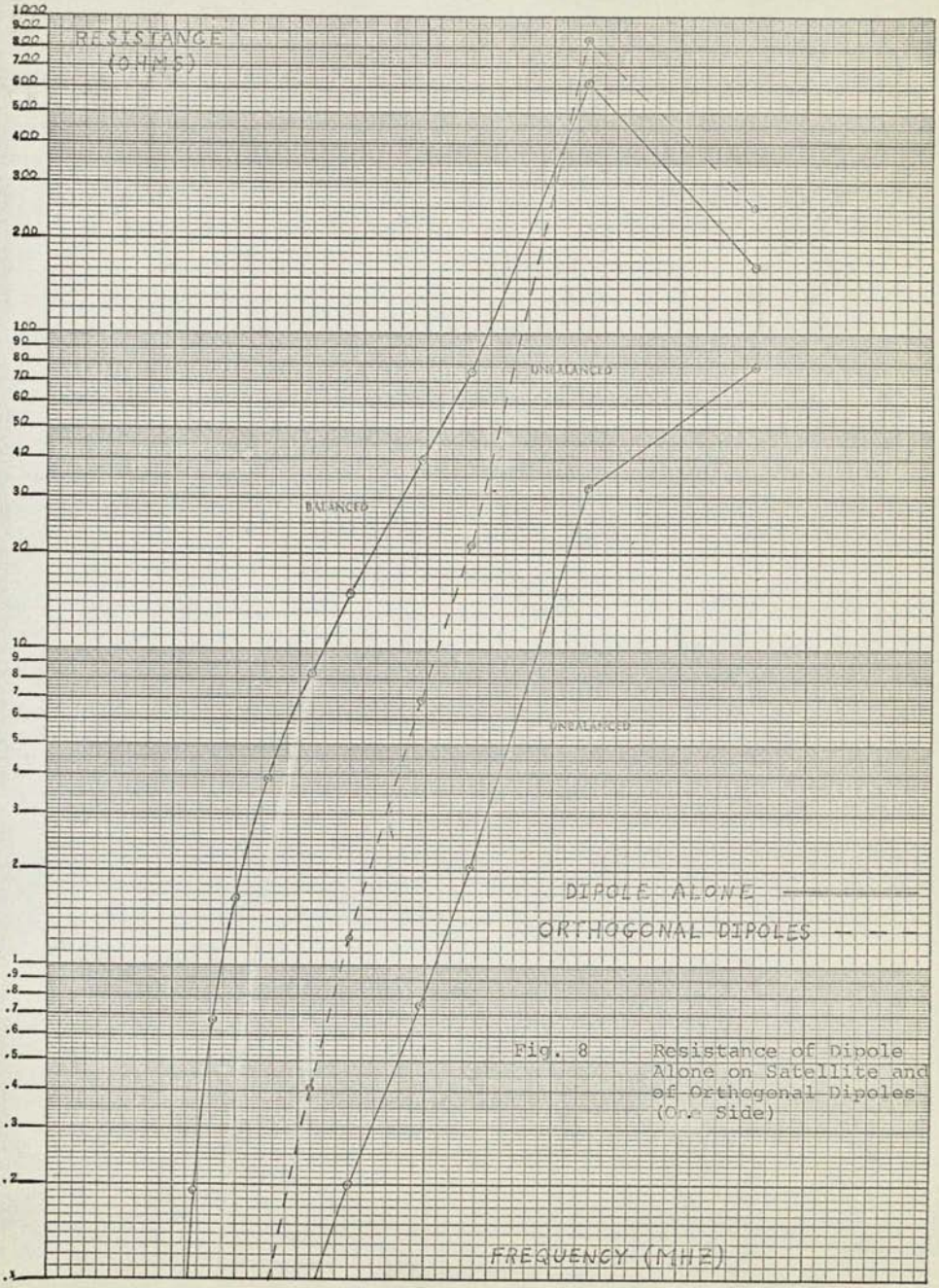


Fig. 8 Resistance of Dipole Alone on Satellite and of Orthogonal Dipoles (One Side)

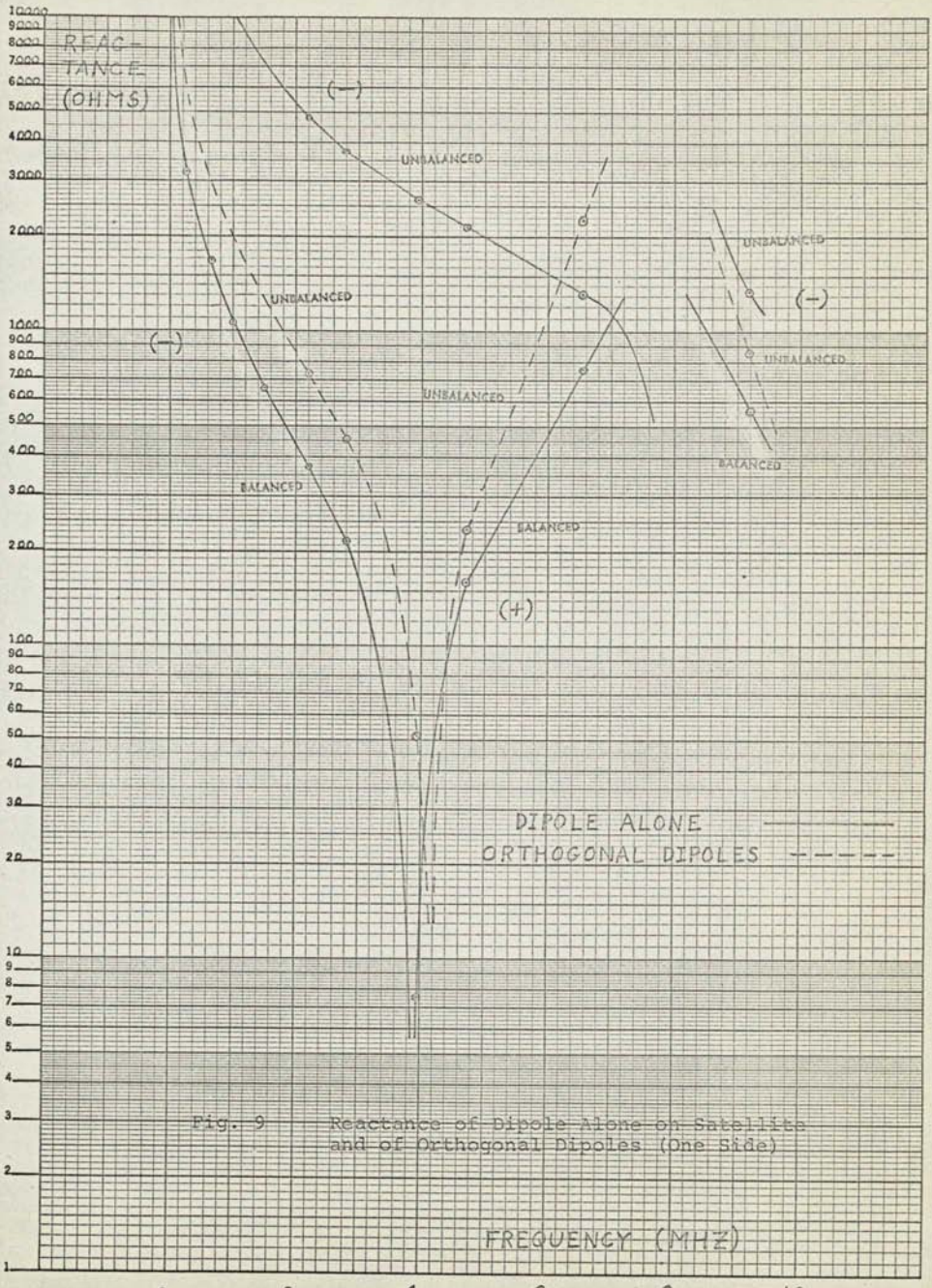


Fig. 9 Reactance of Dipole Alone on Satellite and of Orthogonal Dipoles (One Side)

3. ORTHOGONAL DIPOLES

If the V-antennas and libration damper are replaced by a second dipole, identical to the first, orthogonal to it and coplanar with it, the result is the system shown in Fig. 10. Because the parasitic dipole (on the Y-axis) lies in the equatorial plane of the driven dipole (on the Z-axis), the balanced mode of the system is indistinguishable from that of the dipole mounted alone on the spacecraft, or from that of the dipole in free space. The program was verified to yield this result to as many significant figures as it prints out, but the results are not presented in this report. The unbalanced mode, however, is of some interest, and the results of that calculation are presented in Figs. 8 and 9, and Appendices E and F. It is worthy of note that, in the unbalanced mode, the currents at corresponding points on the two dipoles are exactly equal and opposite in phase.

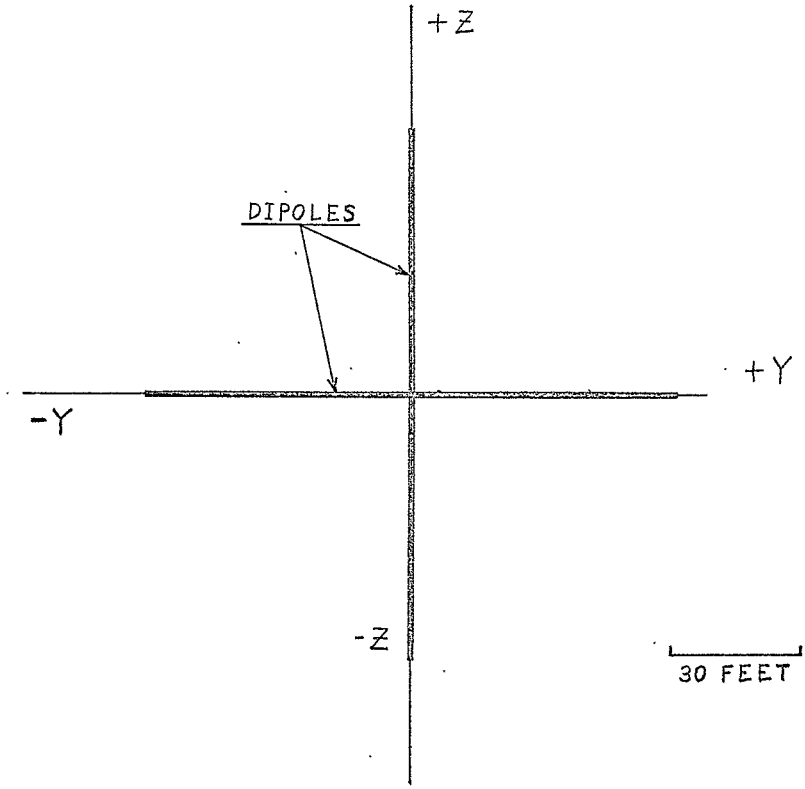


Fig. 10 Orthogonal Dipole Configuration.

4. PREAMPLIFIER IMBALANCE

4.1 Receiver Response

In this section, we shall derive an analytical expression for the signal received at the output of the dipole amplifier system. The dipole, with the amplifiers connected to it, and the equivalent electrical circuit for the balanced mode and unbalanced mode generators of the dipole, are shown in Fig. 11.

Let the input impedance of the amplifiers connected to terminals 1 and 2 of the dipole be Z_1 and Z_2 respectively. Let a wave with unity power density (1 watt/m^2) be incident from an arbitrary direction of space. Let the gain for the balanced mode of the dipole in that direction be G_e and that of the unbalanced mode of the dipole be G_o. The maximum available power in the balanced mode is then

$$P_e = \frac{\lambda^2}{4\pi} G_e \tag{10}$$

where λ is the wavelength (in meters). Similarly, the maximum available power in the unbalanced mode is

$$P_o = \frac{\lambda^2}{4\pi} G_o \tag{11}$$

The applied (or induced) emf's V_e and V_o in Fig. 11 for the balanced and the unbalanced mode respectively are therefore given by

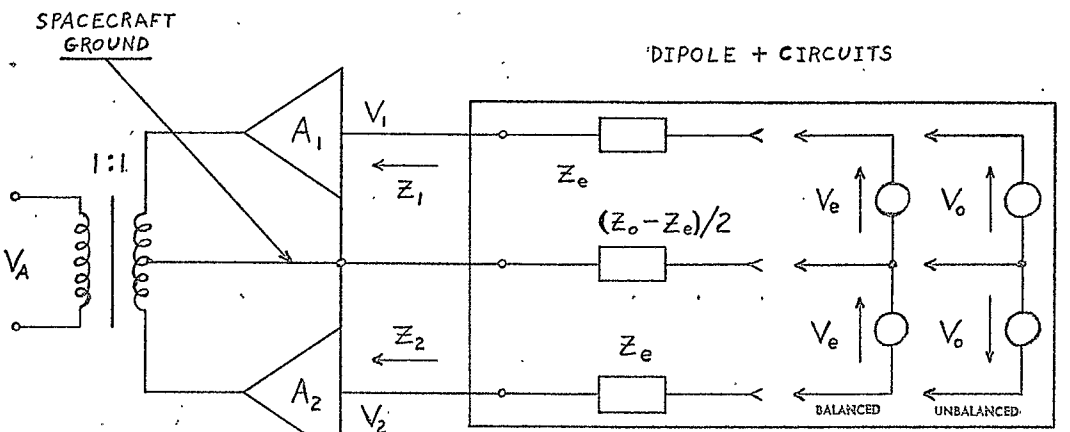


Fig. 11 Equivalent Circuit for Analysis of Amplifier Imbalance.

$$V_e = \sqrt{2R_eP_e} = \frac{\lambda}{\sqrt{2\pi}} \sqrt{R_eG_e} \qquad (12)$$

$$V_o = \sqrt{2R_oP_o} = \frac{\lambda}{\sqrt{2\pi}} \sqrt{R_oG_o} \qquad (13)$$

where $2R_e$ and $R_o/2$ are the input resistances of the dipole in the balanced and the unbalanced modes respectively.

It is not difficult to show on the basis of the equivalent circuits that the voltages appearing at the inputs to the two amplifiers in the two modes are:

$$V_{1e} = \frac{\left(Z_o+Z_2\right)Z_1}{Z_eZ_o+\frac{1}{2}\left(Z_1+Z_2\right)\left(Z_e+Z_o\right)+Z_1Z_2} V_e \qquad (14)$$

$$V_{2e} = -\frac{\left(Z_o+Z_1\right)Z_2}{Z_eZ_o+\frac{1}{2}\left(Z_1+Z_2\right)\left(Z_e+Z_o\right)+Z_1Z_2} V_e \qquad (15)$$

$$V_{1o} = \frac{\left(Z_o+Z_2\right)Z_1}{Z_eZ_o+\frac{1}{2}\left(Z_1+Z_2\right)\left(Z_e+Z_o\right)+Z_1Z_2} V_o \qquad (16)$$

$$V_{2o} = \frac{\left(Z_o+Z_1\right)Z_2}{Z_eZ_o+\frac{1}{2}\left(Z_1+Z_2\right)\left(Z_e+Z_o\right)+Z_1Z_2} V_o \qquad (17)$$

If the gains of the amplifiers connected to terminals 1 and 2 are A_1 and A_2 (generally complex quantities), the net output voltage of the balun-type transformer shown in Fig. 11 will be

$$V_A = A_1V_1 - A_2V_2 \qquad (18)$$

Consequently, we have

$$V_{Ae} = \frac{\lambda}{\sqrt{2\pi}} \frac{\left(Z_1A_1+Z_2A_2\right)Z_o+\left(A_1+A_2\right)Z_1Z_2}{Z_eZ_o+\frac{1}{2}\left(Z_1+Z_2\right)\left(Z_e+Z_o\right)+Z_1Z_2}\sqrt{R_eG_e} \qquad (19$$

and

$$V_{Ao} = \frac{\lambda}{\sqrt{2\pi}} \frac{\left(Z_1A_1-Z_2A_2\right)Z_e+\left(A_1-A_2\right)Z_1Z_2}{Z_eZ_o+\frac{1}{2}\left(Z_1+Z_2\right)\left(Z_e+Z_o\right)+Z_1Z_2}\sqrt{R_oG_o} \quad , \qquad (20$$

where use has been made of Eqs. (12) and (13). It is readily verified that the unbalanced mode of the dipole will not contribute to the output when the two amplifiers are identical. In this case, the amplifier output is given by

$$V_A^\circ = \frac{\lambda}{\sqrt{2\pi}} \frac{2ZA}{Z_e+Z}\sqrt{R_eG_e} \qquad (21)$$

4.2 Effect of Impedance Imbalance

To first order, the balanced mode response is insensitive to differences in input impedance and amplifier gain, but will be affected in second order. In order to investigate the effect of impedance variations alone, let

$$Z_1 = Z + \frac{\Delta Z}{2} \qquad (22)$$

$$Z_2 = Z - \frac{\Delta Z}{2} \qquad (23)$$

$$A_1 = A_2 = A \qquad (24)$$

Equations (19) and (20) then become

$$V_{Ae} = \frac{\lambda}{\sqrt{2\pi}} \frac{2AZZ_o + 2AZ^2 - \frac{1}{2}A(\Delta Z)^2}{Z_e Z_o + Z\left(Z_e + Z_o\right) + Z^2 - \frac{1}{4}(\Delta Z)^2} \sqrt{R_e G_e} \qquad (25)$$

$$V_{Ao} = \frac{\lambda}{\sqrt{2\pi}} \frac{AZ_e \Delta Z}{Z_e Z_o + Z\left(Z_e + Z_o\right) + Z^2 - \frac{1}{4}(\Delta Z)^2} \sqrt{R_o G_o}\ , \qquad (26)$$

or

$$V_{Ae}/V_A{}^\circ = \frac{1 - \frac{(\Delta Z)^2}{4Z\left(Z_o + Z\right)}}{1 - \frac{(\Delta Z)^2}{4\left(Z_e + Z\right)\left(Z_o + Z\right)}} \qquad (27)$$

$$V_{Ao}/V_{Ae} = \frac{Z_e \Delta Z}{2\left[Z\left(Z_o + Z\right) - \frac{1}{4}(\Delta Z)^2\right]} \sqrt{\frac{R_o G_o}{R_e G_e}} \qquad (28)$$

Thus it is seen that there are two effects of impedance imbalance alone, first a change in output voltage independent of direction of arrival of the signal, and second a spurious response to the unbalanced mode depending upon the gain of that mode relative to the balanced mode in the direction of the signal. The degradation in balanced-mode signal is shown in Table I for a constant input impedance and for a matched input impedance (i.e., conjugate of antenna impedance). The coefficient for calculating the ratio of unbalanced-mode signal to balanced-mode signal under the same conditions is set forth in Table II.

Table I

Degradation in Balanced-Mode Receiver Output (dB)
for High Impedance and Conjugate Match Input
as a Function of Input Impedance Imbalance

Freq. (MHz)	V-Antenna Length	Impedance	ΔZ/Z(%) 2	10	15	25
.202	750	5000-j2000	--	--	--	0.03
		Z_e*	3.92	28.3	34.8	42.6
	450	5000-j2000	--	--	--	0.03
		Z_e*	4.57	29.4	36.1	44.1
.700	750	5000-j2000	--	--	--	0.03
		Z_e*	2.07	17.7	24.1	32.6
	450	5000-j2000	--	--	--	0.03
		Z_e*	3.85	24.0	30.6	38.7
2.20	750	5000-j2000	--	--	--	--
		Z_e*	0.05	1.10	2.42	5.53
	450	5000-j2000	--	--	--	--
		Z_e*	0.02	0.36	0.77	2.00
3.93	750	5000-j2000	--	--	--	--
		Z_e*	--	--	--	--
	450	5000-j2000	--	--	--	--
		Z_e*	--	--	--	--
6.55	750	5000-j2000	--	--	--	--
		Z_e*	--	0.02	0.04	0.08
	450	5000-j2000	--	--	--	0.02
		Z_e*	--	0.02	0.04	0.09

Table II

Coefficient (dB) Relating Unbalanced Mode Signal to Balanced Mode for Two Values of Input Impedance as a Function of Input Impedance Imbalance.
Add Gain Ratio G_o/G_e (dB) in Desired Direction to Obtain Ratio.

Freq. (MHz)	V-Antenna Length	Impedance	ΔZ/Z (%) 2	10	15	25
.202	750	5000-j2000	-32.7	-18.7	-15.2	-10.7
		Z_e*	- 4.8	+ 8.9	+12.1	+15.5
	450	5000-j2000	-30.3	-16.3	-12.8	- 8.3
		Z_e*	- 4.0	+ 9.7	+12.9	+16.5
.700	750	5000-j2000	-30.5	-16.5	-12.9	- 8.4
		Z_e*	- 2.7	+11.2	+14.7	+19.2
	450	5000-j2000	-34.2	-20.2	-16.6	-12.1
		Z_e*	+ 0.2	+14.0	+17.4	+21.2
2.20	750	5000-j2000	-52.5	-38.5	-35.0	-30.5
		Z_e*	-20.1	- 6.2	- 2.7	+ 1.6
	450	5000-j2000	-44.8	-30.8	-27.3	-22.7
		Z_e*	-24.9	-10.9	- 7.4	- 2.9
3.93	750	5000-j2000	-76.1	-62.1	-58.6	-54.0
		Z_e*	-49.7	-35.8	-32.2	-27.8
	450	5000-j2000	-75.8	-61.9	-58.3	-53.8
		Z_e*	-50.4	-36.4	-32.9	-28.4
6.55	750	5000-j2000	-55.5	-41.5	-38.0	-33.5
		Z_e*	-42.2	-28.2	-24.7	-20.2
	450	5000-j2000	-56.5	-42.5	-39.0	-34.5
		Z_e*	-42.1	-28.1	-24.6	-20.1

In all cases, and especially at frequencies well below the first dipole resonance, the use of a conjugate match circuit in the input of the preamplifiers results in such high Q that response becomes very strongly dependent upon circuit parameter values. The high-impedance circuit, while sacrificing considerable gain, is relatively insensitive to imbalances, and offers a much greater bandwidth.

It is frequently of interest to determine the response of the system to energy incident from a number of directions simultaneously, and the effect of the unbalanced mode under these conditions. The unbalanced voltage induced by an incoming wave tends to be 90° out of phase with the balanced voltage induced by the same wave, and so the power in the two modes tends to add. An accurate analysis of the change in output voltage produced would necessitate an integration over one-quarter of the total solid angle and therefore would require a much more complete sampling of the antenna gain than that which is called for in this contract. An approximate assessment of the average magnitude of the effect can be obtained by using the average gains calculated by the program for the two modes, in conjunction with the coefficients shown in Table II. When the result of this computation is combined with the information in Table I, one obtains Table III, representing the approximate change in preamplifier output caused by varying amounts of impedance imbalance.

Table III

Change in Receiver Output Voltage (%)
as a Function of Input Impedance Imbalance

Freq. (MHz)	V-Antenna Length	Impedance	ΔZ/Z(%)			
			2	10	15	25
.202	750	5000-j2000	--	--	--	--
		Z_e*	-35	-95	-97	-98
	450	5000-j2000	--	--	--	--
		Z_e*	-41	-96	-98	-99
.700	750	5000-j2000	--	--	+ 1	+ 2
		Z_e*	-17	-75	-84	-90
	450	5000-j2000	--	--	--	--
		Z_e*	-35	-93	-96	-98
2.20	750	5000-j2000	--	--	--	--
		Z_e*	--	-10	-21	-42
	450	5000-j2000	--	--	--	--
		Z_e*	--	- 3	- 7	-16
3.93	750	5000-j2000	--	--	--	--
		Z_e*	--	--	--	--
	450	5000-j2000	--	--	--	--
		Z_e*	--	--	--	--
6.55	750	5000-j2000	--	--	--	--
		Z_e*	--	--	--	- 1
	450	5000-j2000	--	--	--	--
		Z_e*	--	--	--	- 1

4.3 Effect of Gain Imbalance

The result of amplifier gain variations alone may be seen by taking

$$Z_1 = Z_2 = Z. \tag{29}$$

Some simple substitutions lead to

$$V_{Ae}/V_A{}^\circ = \frac{A_1+A_2}{2A} \tag{30}$$

$$V_{Ao}/V_{Ae} = \frac{A_1-A_2}{A_1+A_2}\sqrt{\frac{R_oG_o}{R_eG_e}} \tag{31}$$

If the imbalance is in amplitude, we have

$$A_1 = A + \frac{\Delta A}{2} \tag{32}$$

$$A_2 = A - \frac{\Delta A}{2} \tag{33}$$

$$V_{Ae}/V_A{}^\circ = 1 \tag{34}$$

$$V_{Ao}/V_{Ae} = \frac{\Delta A}{2A}\sqrt{\frac{R_oG_o}{R_eG_e}} \tag{35}$$

On the other hand, if the imbalance involves phase shift, the corresponding relations are

$$A_1 = A\varepsilon^{j\Delta\phi/2} \tag{36}$$

$$A_2 = A\varepsilon^{-j\Delta\phi/2} \tag{37}$$

$$V_{Ae}/V_A{}^\circ = \cos\left(\frac{\Delta\phi}{2}\right) \tag{38}$$

$$V_{Ao}/V_{Ae} = \tan\left(\frac{\Delta\phi}{2}\right)\sqrt{\frac{R_o G_o}{R_e G_e}} \tag{39}$$

Numerical data for these various conditions appear in Tables IV through VIII.

Table IV:

Coefficient (dB) Relating Unbalanced Mode Signal to Balanced Mode as a Function of Amplifier Gain Imbalance. Add Gain Ratio G_o/G_e (dB) in Desired Direction to Obtain Ratio

Frequency (MHz)	V-Antenna Length	$(A_1/A_2)^2$ (dB)			
		0.1	0.5	1.0	2.0
.202	750	-32.6	-18.6	-12.6	- 6.6
	450	-30.2	-16.2	-10.2	- 4.2
.700	750	-22.7	- 8.7	- 2.7	+ 3.3
	450	-26.5	-12.5	- 6.5	- 0.5
2.20	750	-33.3	-19.3	-13.3	- 7.3
	450	-24.9	-10.9	- 4.9	+ 1.1
3.93	750	-36.5	-22.5	-16.5	-10.5
	450	-35.3	-21.3	-15.3	- 9.3
6.55	750	-44.8	-30.8	-24.8	-18.8
	450	-35.2	-21.2	-15.2	- 9.2

Table V

Change in Receiver Output Voltage (%)
as a Function of Amplifier Gain Imbalance

Frequency (MHz)	V-Antenna Length	$(A_1/A_2)^2$ (dB)			
		0.1	0.5	1.0	2.0
.202	750	--	--	--	+ 1
	450	--	--	--	--
.700	750	--	+ 1	+ 5	+11
	450	--	--	+ 1	+ 6
2.20	750	--	--	--	+ 1
	450	--	+ 1	+ 3	+15
3.93	750	--	--	--	+ 1
	450	--	--	--	+ 1
6.55	750	--	--	--	--
	450	--	--	--	+ 2

Table VI

Degradation in Balanced-Mode Receiver Output (dB) as a Function of Amplifier Phase Shift Imbalance

Frequency (MHz)	V-Antenna Length	Δφ 10°	20°	45°	90°
All	Any	0.03	0.13	0.7	3.0

Table VII

Coefficient (dB) Relating Unbalanced Mode Signal to Balanced Mode as a Function of Amplifier Phase Shift Imbalance. Add Gain Ratio G_o/G_e (dB) in Desired Direction to Obtain Ratio.

Frequency (MHz)	V-Antenna Length	Δφ 10°	20°	45°	90°
.202	750	- 9.0	- 2.9	+ 4.5	+12.2
	450	- 6.6	- 0.5	+ 6.9	+14.6
.700	750	+ 0.9	+ 7.0	+14.4	+22.1
	450	- 2.9	+ 3.2	+10.6	+18.3
2.20	750	- 9.7	- 3.6	+ 3.8	+11.5
	450	- 1.3	+ 4.8	+12.2	+19.9
3.93	750	-12.9	- 6.8	+ 0.6	+ 8.3
	450	-11.7	- 5.6	+ 1.8	+ 9.5
6.55	750	-21.2	-15.1	- 7.7	0
	450	-11.6	- 5.5	+ 1.9	+ 9.6

Table VIII

Change in Receiver Output Voltage (%)
as a Function of Amplifier Phase Shift Imbalance

Frequency (MHz)	V-Antenna Length	$\Delta\phi$			
		10°	20°	45°	90°
.202	750	--	+ 1	+ 3	+12
	450	--	- 1	- 5	-21
.700	750	+11	+39	+134	+307
	450	+ 3	+12	+ 50	+129
2.20	750	--	+ 1	+ 7	+ 21
	450	+ 8	+32	+109	+254
3.93	750	--	+ 1	+ 2	+ 8
	450	--	+ 1	+ 3	+11
6.55	750	--	- 1	- 5	-21
	450	+ 1	+ 2	+12	+38

APPENDIX A

CURRENT DISTRIBUTIONS FOR DIPOLE IN PRESENCE OF V-ANTENNAS AND LIBRATION DAMPER

The body of this Appendix consists of a reproduction of a printout produced by the Wire Antenna Scattering Program WIRA. The various sections of that listing will now be described and explained.

The first table of values lists the coordinates of the endpoints of 22 wires making up the configuration, along with the wire radii at each end and the number of sampling intervals in each wire. The boundary condition on the electric field is satisfied at the center of each such interval. For the purposes of this discussion, the gaps mentioned in the same table can be regarded simply as locations accessible to connection of sources or passive networks. Wire number 1 represents one half of the dipole, and wire number 2 the other half. Wires 3 through 8 represent one V-antenna arm, and 9 through 14 its mate. The other pair of V-antenna arms does not appear in the tabulation because it is automatically taken into account by the magnetic wall in the X-Z plane. Wires 15 through 18 and 19 through 22 describe the libration damper.

Next come various printouts frequency by frequency. Within each frequency there are two excitation modes, each described by sources and networks. Excitation mode 1 is the balanced mode, and mode 2 the unbalanced, as can be seen in the table of gap sources. The table of networks describes the passive components included in the circuit.

The next major table is that giving the actual computed current distribution. Here are listed the coordinates, in wavelengths, of the center of each sampling interval, followed by three amplitudes and three phases, corresponding to the beginning, center, and end of the interval.

Then appears certain information concerning voltages and impedances at the various gaps. It is here (at the left) that the input impedance for the driven gaps is found, defined as the applied voltage divided by the input current, for the individual gap.

Finally comes the power budget which, it should be remembered, at frequencies of 2.2 MHz and below is only correct as to the input power and wire loss.

ANTENNA/SCATTERING PROGRAM WIRA

****

TCI.2236 NASA SATELLITE ANT. LONG V INTERPOLATION SCHEME 1

NUMBER OF WIRES 22
THE X-Z PLANE IS A MAGNETIC PLANE
WIRE CONDUCTIVITY INFINITE

WIRE COORDINATES IN FEET AND WIRE RADII IN INCHES

WIRE NO		X1	Y1	Z1	RAD1		X2	Y2	Z2	RAD2	INTERVALS
1	GAP 1	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	61.5000	.250000	3
2	GAP 2	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	-61.5000	.250000	3
3	GAP 3	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	30.8000	.250000	3
4		-0.0000	53.2000	30.8000	.250000		-0.0000	89.6000	51.8000	.250000	1
5		-0.0000	89.6000	51.8000	.250000		-0.0000	163.7000	94.5000	.250000	1
6		-0.0000	163.7000	94.5000	.250000		-0.0000	325.9000	188.3000	.250000	1
7		-0.0000	325.9000	188.3000	.250000	GAP 4	-0.0000	488.4000	282.0000	.250000	2
8	GAP 5	-0.0000	488.4000	282.0000	.250000		0.0000	650.8000	375.7000	.250000	2
9	GAP 6	-0.0000	-0.0000	-0.0000	.250000		0.0000	53.2000	-30.8000	.250000	3
10		-0.0000	53.2000	-30.8000	.250000		0.0000	89.6000	-51.8000	.250000	1
11		-0.0000	89.6000	-51.8000	.250000		0.0000	163.7000	-94.5000	.250000	1
12		-0.0000	163.7000	-94.5000	.250000		-0.0000	325.9000	-188.3000	.250000	1
13		-0.0000	325.9000	-188.3000	.250000	GAP 7	-0.0000	488.4000	-282.0000	.250000	2
14	GAP 8	-0.0000	488.4000	-282.0000	.250000		-0.0000	650.8000	-375.7000	.250000	2
15	GAP 9	-0.0000	-0.0000	-0.0000	.290000		55.7000	-0.0000	26.0000	.290000	3
16		55.7000	-0.0000	26.0000	.290000		93.8000	-0.0000	43.8000	.290000	1
17		93.8000	-0.0000	43.8000	.290000		171.2000	-0.0000	79.9000	.290000	1
18		171.2000	-0.0000	79.9000	.290000		286.9000	-0.0000	134.6000	.290000	1
19	GAP 10	-0.0000	-0.0000	-0.0000	.290000		-55.7000	-0.0000	-26.0000	.290000	3
20		-55.7000	-0.0000	-26.0000	.290000		-93.8000	-0.0000	-43.8000	.290000	1
21		-93.8000	-0.0000	-43.8000	.290000		-171.2000	-0.0000	-79.9000	.290000	1
22		-171.2000	-0.0000	-79.9000	.290000		-286.9000	-0.0000	-134.6000	.290000	1

FREQUENCY = .2020 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 281

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 11.9 PER CENT FOR GAPS 9 AND 3

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 10	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	#000000.0000	-0.0000	-0.0000	-0.0000
10	IMP	2- 0	#000000.0000	-0.0000	-0.0000	-0.0000
11	IMP	1- 2	#000000.0000	-0.0000	-0.0000	-0.0000

WIRE NO	INT NO	COORDINATES X WAVELENGTHS	Y WAVELENGTHS	Z WAVELENGTHS	CURRENT DISTRIBUTION AMPLITUDE			PHASE			NORMAL ELECTRIC FIELD * RADIUS VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			185.649	-.0
1	1	0.0000	0.0000	.0021	.1903	.1519	.1188	90.0	90.0	90.0	162.308	-.0
1	2	0.0000	0.0000	.0063	.1210	.0907	.0610	90.0	90.0	90.0	136.263	-.0
1	3	0.0000	0.0000	.0105	.0621	.0319	.0000	90.0	90.0	90.0	141.005	-.0
		0.0000	0.0000	0.0000	GAP 2			GAP 2			185.649	180.0
2	4	0.0000	0.0000	-.0021	.1903	.1519	.1188	-90.0	-90.0	-90.0	162.308	180.0
2	5	0.0000	0.0000	-.0063	.1210	.0907	.0610	-90.0	-90.0	-90.0	136.263	180.0

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE X AMP	AMPLITUDE Y AMP	AMPLITUDE Z AMP	PHASE X DEG	PHASE Y DEG	PHASE Z DEG	VOLTS	DEG
2	6	0.0000	0.0000	-.0105	.0621	.0319	.0000	-90.0	-90.0	90.0	141.005	180.0
		0.0000	-.0000	-.0000	GAP 3			GAP 3			20.060	178.6
3	7	0.0000	.0018	.0011	.0242	.0205	.0181	-106.6	-109.4	-111.8	14.534	178.4
3	8	0.0000	.0055	.0032	.0185	.0168	.0155	-111.4	-113.4	-115.2	7.285	177.4
3	9	0.0000	.0091	.0053	.0155	.0145	.0136	-115.1	-116.7	-118.2	4.667	176.1
4	10	0.0000	.0147	.0085	.0137	.0125	.0115	-118.0	-120.4	-122.5	2.745	173.4
5	11	0.0000	.0260	.0150	.0117	.0104	.0093	-121.8	-124.4	-126.6	1.378	166.3
6	12	0.0000	.0502	.0290	.0096	.0079	.0063	-125.5	-128.0	-130.5	.829	154.0
7	13	0.0000	.0752	.0435	.0064	.0056	.0048	-130.2	-131.7	-133.4	.786	149.5
7	14	0.0000	.0919	.0531	.0048	.0040	.0033	-133.3	-135.7	-139.3	.798	148.9
		0.0000	.1002	.0579			GAP 4			GAP 4	.808	149.1
		0.0000	.1002	.0579	GAP 5			GAP 5			.766	129.5
8	15	0.0000	.1086	.0627	.0033	.0025	.0017	-139.3	-139.1	-138.9	.783	130.2
8	16	0.0000	.1252	.0723	.0017	.0009	.0000	-139.1	-139.1	-139.0	.845	130.9
		0.0000	-.0000	.0000	GAP 6			GAP 6			20.060	-1.4
9	17	0.0000	.0018	.0011	.0242	.0205	.0181	73.4	70.6	68.2	14.534	-1.6
9	18	0.0000	.0055	-.0032	.0185	.0168	.0155	68.6	66.6	64.8	7.285	-2.6
9	19	0.0000	.0091	-.0053	.0155	.0145	.0136	64.9	63.3	61.8	4.667	-3.9
10	20	0.0000	.0147	-.0085	.0137	.0125	.0115	62.0	59.6	57.5	2.745	-6.6
11	21	0.0000	.0260	-.0150	.0117	.0104	.0093	58.2	55.6	53.4	1.378	-13.7
12	22	0.0000	.0502	-.0290	.0096	.0079	.0063	54.5	52.0	49.5	.829	-26.0
13	23	0.0000	.0752	-.0435	.0064	.0056	.0048	49.8	48.3	46.6	.786	-30.5
13	24	0.0000	.0919	-.0531	.0048	.0040	.0033	46.7	44.3	40.7	.798	-31.1
		0.0000	.1002	-.0579			GAP 7			GAP 7	.808	-30.9
		0.0000	.1002	-.0579	GAP 8			GAP 8			.766	-50.5
14	25	0.0000	.1086	-.0627	.0033	.0025	.0017	40.7	40.9	41.1	.783	-49.8
14	26	0.0000	.1252	-.0723	.0017	.0009	.0000	40.9	40.9	41.0	.845	-49.1
		0.0000	0.0000	0.0000	GAP 9			GAP 9			14.287	-179.9
15	27	.0019	0.0000	.0009	.0125	.0098	.0079	-89.8	-89.8	-89.7	10.466	-179.9
15	28	.0057	0.0000	.0027	.0082	.0068	.0058	-89.7	-89.7	-89.7	5.365	-179.8
15	29	.0095	0.0000	.0044	.0059	.0050	.0044	-89.7	-89.7	-89.6	3.410	-179.8
16	30	.0153	0.0000	.0072	.0045	.0034	.0027	-89.7	-89.6	-89.6	1.955	-179.7
17	31	.0272	0.0000	.0127	.0029	.0019	.0012	-89.6	-89.7	-89.7	.895	-179.6
18	32	.0470	0.0000	.0220	.0014	.0007	.0000	-89.8	-89.9	92.6	.512	-179.8
		0.0000	0.0000	0.0000	GAP 10			GAP 10			14.287	.1
19	33	-.0019	0.0000	-.0009	.0125	.0098	.0079	90.2	90.2	90.3	10.466	.1
19	34	-.0057	0.0000	-.0027	.0082	.0068	.0058	90.3	90.3	90.3	5.365	.2
19	35	-.0095	0.0000	-.0044	.0059	.0050	.0044	90.3	90.3	90.4	3.410	.2
20	36	-.0153	0.0000	-.0072	.0045	.0034	.0027	90.3	90.4	90.4	1.955	.3
21	37	-.0272	0.0000	-.0127	.0029	.0019	.0012	90.4	90.3	90.3	.895	.4
22	38	-.0470	0.0000	-.0220	.0014	.0007	.0000	90.2	90.1	-87.4	.512	.2

IMPEDANCE DATA

GAP NO	INPUT RESIST.	INPUT REACT.	INPUT CONDUCT.	INPUT SUSCEPT.	LOAD RESIST.	LOAD REACT.	GAP RESIST.	GAP REACT.	GAP VOLTAGE

	OHMS	OHMS	MHOS	MHOS	OHMS	OHMS	OHMS	OHMS	VOLT	DEGREES
1	3.595	-5255.880	.000000	.000190	0.000	0.000	1.823	-5255.882	1000.000	0.0
2	3.595	-5255.880	.000000	.000190	0.000	0.000	1.823	-5255.882	1000.000	-180.0
3					INFINITE	INFINITE	-99.959	2.030	2.417	72.2
6					INFINITE	INFINITE	-99.959	2.030	2.417	-107.8
9					INFINITE	INFINITE	.000	.000	.000	-80.3
10					INFINITE	INFINITE	-.000	-.000	.000	-80.3
4					INFINITE	INFINITE	-600.000	.000	1.954	-139.3
7					INFINITE	INFINITE	-600.000	.000	1.954	40.7

INPUT POWER = .260 WATTS
RADIATED POWER = -.127 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = .387 WATTS
RADIATION EFFICIENCY = -48.86 PER CENT

EXCITATION MODE

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

WIRE NO.	INT NO	COORDINATES X WAVELENGTHS	Y WAVELENGTHS	Z WAVELENGTHS	CURRENT DISTRIBUTION AMPLITUDE	AMP	AMP	PHASE DEG	DEG	DEG	NORMAL ELECTRIC FIELD * RADIUS VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1						164.373	-.6
1	1	0.0000	0.0000	.0021	.1781	.1438	.1133	89.4	89.4	89.4	147.014	-.6
1	2	0.0000	0.0000	.0063	.1151	.0866	.0585	89.4	89.4	89.4	128.424	-.6

06/18/70

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
1	3	0.0000	0.0000	.0105	.0595	.0306	.0000	89.4	89.4	-90.7	135.037	-.6
		0.0000	0.0000	0.0000	GAP 2			GAP 2			164.373	-.6
2	4	0.0000	0.0000	-.0021	.1781	.1438	.1133	89.4	89.4	89.4	147.014	-.6
2	5	0.0000	0.0000	-.0063	.1151	.0866	.0585	89.4	89.4	89.4	128.424	-.6
2	6	0.0000	0.0000	-.0105	.0595	.0306	.0000	89.4	89.4	-90.7	135.037	-.6
		0.0000	-.0000	-.0000	GAP 3			GAP 3			49.593	179.7
3	7	0.0000	.0018	.0011	.0888	.0793	.0730	-90.6	-90.7	-90.7	35.845	179.8
3	8	0.0000	.0055	.0032	.0741	.0696	.0660	-90.7	-90.8	-90.8	18.212	-179.9
3	9	0.0000	.0091	.0053	.0663	.0633	.0608	-90.8	-90.9	-90.9	12.477	-179.5
4	10	0.0000	.0147	.0085	.0610	.0568	.0534	-90.9	-91.1	-91.2	8.460	-179.0
5	11	0.0000	.0260	.0150	.0539	.0486	.0440	-91.2	-91.5	-91.9	5.398	-178.0
6	12	0.0000	.0502	.0290	.0448	.0369	.0295	-91.9	-93.0	-94.6	3.842	-176.7
7	13	0.0000	.0752	.0435	.0296	.0260	.0224	-94.6	-95.7	-97.3	3.661	-176.3
7	14	0.0000	.0919	.0531	.0224	.0188	.0152	-97.2	-99.4	-103.0	3.713	-175.5
		0.0000	.1002	.0579			GAP 4			GAP 4	3.754	-174.7
		0.0000	.1002	.0579	GAP 5			GAP 5			3.573	165.3
8	15	0.0000	.1086	.0627	.0152	.0115	.0078	-103.0	-102.6	-102.3	3.644	166.3
8	16	0.0000	.1252	.0723	.0079	.0041	.0000	-102.5	-102.4	-103.9	3.925	167.5
		0.0000	-.0000	.0000	GAP 6			GAP 6			49.593	179.7
9	17	0.0000	.0018	-.0011	.0888	.0793	.0730	-90.6	-90.7	-90.7	35.845	179.8
9	18	0.0000	.0055	-.0032	.0741	.0696	.0660	-90.7	-90.8	-90.8	18.212	-179.9
9	19	0.0000	.0091	-.0053	.0663	.0633	.0608	-90.8	-90.9	-90.9	12.477	-179.5
10	20	0.0000	.0147	-.0085	.0610	.0568	.0534	-90.9	-91.1	-91.2	8.460	-179.0
11	21	0.0000	.0260	-.0150	.0539	.0486	.0440	-91.2	-91.5	-91.9	5.398	-178.0
12	22	0.0000	.0502	-.0290	.0448	.0369	.0295	-91.9	-93.0	-94.6	3.842	-176.7
13	23	0.0000	.0752	-.0435	.0296	.0260	.0224	-94.6	-95.7	-97.3	3.661	-176.3
13	24	0.0000	.0919	-.0531	.0224	.0188	.0152	-97.2	-99.4	-103.0	3.713	-175.5
		0.0000	.1002	-.0579			GAP 7			GAP 7	3.754	-174.7
		0.0000	.1002	-.0579	GAP 8			GAP 8			3.573	165.3
14	25	0.0000	.1086	-.0627	.0152	.0115	.0078	-103.0	-102.6	-102.3	3.644	166.3
14	26	0.0000	.1252	-.0723	.0079	.0041	.0000	-102.5	-102.4	-103.9	3.925	167.5
		0.0000	0.0000	0.0000	GAP 9			GAP 9			37.880	179.1
15	27	.0019	0.0000	.0009	.0006	.0064	.0106	-80.8	88.1	88.5	25.439	179.1
15	28	.0057	0.0000	.0027	.0096	.0121	.0138	88.4	88.6	88.6	9.457	179.0
15	29	.0095	0.0000	.0044	.0136	.0147	.0155	88.6	88.6	88.7	4.244	179.0
16	30	.0153	0.0000	.0072	.0153	.0159	.0158	88.6	88.7	88.7	.598	178.8
17	31	.0272	0.0000	.0127	.0153	.0136	.0111	88.6	88.6	88.6	2.300	-1.2
18	32	.0470	0.0000	.0220	.0108	.0058	.0000	88.6	88.5	87.9	3.922	-1.4
		0.0000	0.0000	0.0000	GAP 10			GAP 10			37.880	179.1
19	33	-.0019	0.0000	-.0009	.0006	.0064	.0106	-80.8	88.1	88.5	25.439	179.1
19	34	-.0057	0.0000	-.0027	.0096	.0121	.0138	88.4	88.6	88.6	9.457	179.0
19	35	-.0095	0.0000	-.0044	.0136	.0147	.0155	88.6	88.6	88.7	4.244	179.0
20	36	-.0153	0.0000	-.0072	.0153	.0159	.0158	88.6	88.7	88.7	.598	178.8
21	37	-.0272	0.0000	-.0127	.0153	.0136	.0111	88.6	88.6	88.6	2.300	-1.2
22	38	-.0470	0.0000	-.0220	.0108	.0058	.0000	88.6	88.5	87.9	3.922	-1.4

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	58.374	-5615.865	.000002	.000178	0.000	0.000	58.262	-5615.867	1000.000	0.0
2	58.374	-5615.865	.000002	.000178	0.000	0.000	58.262	-5615.867	1000.000	0.0
3					INFINITE	INFINITE	-99.959	2.030	8.873	88.2
6					INFINITE	INFINITE	-99.959	2.030	8.873	88.2
9					INFINITE	INFINITE	-.000	105052.768	60.875	9.7
10					INFINITE	INFINITE	-.000	105052.768	60.875	9.7
4					INFINITE	INFINITE	-600.000	.000	9.091	-103.0
7					INFINITE	INFINITE	-600.000	-.000	9.091	-103.0

INPUT POWER = 3.701 WATTS
RADIATED POWER = -.005 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 3.707 WATTS
RADIATION EFFICIENCY = -.15 PER CENT

FREQUENCY = .3110 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 282

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 3.7 PER CENT FOR GAPS 9 AND 6

EXCITATION MODE 1.

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9-10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	*600000.0000	-0.0000	-0.0000	-0.0000
10	IMP	2- 0	*600000.0000	-0.0000	-0.0000	-0.0000
11	IMP	1- 2	9770000.0000	-0.0000	-0.0000	-0.0000

WIRE NO	INT NO	COORDINATES X WAVELENGTHS	COORDINATES Y WAVELENGTHS	COORDINATES Z WAVELENGTHS	CURRENT DISTRIBUTION AMPLITUDE AMP	AMP	AMP	CURRENT DISTRIBUTION PHASE DEG	DEG	DEG	NORMAL ELECTRIC FIELD * RADIUS VOLTS	DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1			185.590	-.0
1	1	0.0000	0.0000	.0032	.2937	.2347	.1835	90.0	90.0	90.0	162.441	-.0
1	2	0.0000	0.0000	.0097	.1870	.1402	.0943	90.0	90.0	90.0	136.679	-.0
1	3	0.0000	0.0000	.0162	.0961	.0493	.0000	90.0	90.0	-90.0	141.621	-.0
		0.0000	0.0000	.0000	GAP 2			GAP 2			185.590	180.0
2	4	0.0000	0.0000	-.0032	.2937	.2347	.1835	-90.0	-90.0	-90.0	162.441	180.0
2	5	0.0000	0.0000	-.0097	.1870	.1402	.0943	-90.0	-90.0	-90.0	136.679	180.0
2	6	0.0000	0.0000	-.0162	.0961	.0493	.0000	-90.0	-90.0	90.0	141.621	180.0
		0.0000	-.0000	-.0000	GAP 3			GAP 3			19.733	178.7
3	7	0.0000	.0028	.0016	.0316	.0279	.0257	-136.6	-145.1	-152.1	14.244	178.4
3	8	0.0000	.0084	.0049	.0260	.0247	.0238	-150.8	-156.1	-160.6	7.034	177.0
3	9	0.0000	.0140	.0081	.0239	.0233	.0228	-160.3	-164.0	-167.1	4.417	174.9
4	10	0.0000	.0226	.0130	.0228	.0222	.0217	-166.6	-171.4	-175.1	2.494	169.5
5	11	0.0000	.0400	.0231	.0217	.0208	.0199	-174.0	-178.4	178.3	1.180	150.0
6	12	0.0000	.0774	.0447	.0199	.0176	.0147	179.6	175.5	171.6	.929	110.9
7	13	0.0000	.1158	.0669	.0147	.0131	.0115	171.8	169.6	166.8	1.122	98.6
7	14	0.0000	.1415	.0817	.0115	.0097	.0079	166.9	163.2	157.6	1.256	96.1
		0.0000	.1543	.0891			GAP 4			GAP 4	1.317	95.7
		0.0000	.1543	.0891	GAP 5			GAP 5			1.148	65.6
8	15	0.0000	.1672	.0965	.0079	.0061	.0041	157.6	158.0	158.3	1.208	66.9
8	16	0.0000	.1928	.1113	.0042	.0022	.0000	158.0	158.0	-22.4	1.353	68.0
		0.0000	-.0000	.0000	GAP 6			GAP 6			19.733	-1.3
9	17	0.0000	.0028	-.0016	.0316	.0279	.0257	43.4	34.9	27.9	14.244	-1.6

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
9	18	0.0000	.0084	-.0049	.0260	.0247	.0238	29.2	23.9	19.4	7.034	-3.0
9	19	0.0000	.0140	-.0081	.0239	.0233	.0228	19.7	16.0	12.9	4.417	-5.1
10	20	0.0000	.0226	-.0130	.0228	.0222	.0217	13.4	8.6	4.9	2.494	-10.5
11	21	0.0000	.0400	-.0231	.0217	.0208	.0199	6.0	1.6	-1.7	1.180	-30.0
12	22	0.0000	.0774	-.0447	.0199	.0176	.0147	-.4	-4.5	-8.4	.929	-69.1
13	23	0.0000	.1158	-.0669	.0147	.0131	.0115	-8.2	-10.4	-13.2	1.122	-81.4
13	24	0.0000	.1415	-.0817	.0115	.0097	.0079	-13.1	-16.8	-22.4	1.256	-83.9
		0.0000	.1543	-.0891			GAP 7			GAP 7	1.317	-84.3
		0.0000	.1543	-.0891	GAP 8			GAP 8			1.148	-114.4
14	25	0.0000	.1672	-.0965	.0079	.0061	.0041	-22.4	-22.0	-21.7	1.208	-113.1
14	26	0.0000	.1928	-.1113	.0042	.0022	.0000	-22.0	-22.0	157.6	1.353	-112.0
		0.0000	0.0000	0.0000	GAP 9			GAP 9			14.314	-179.9
15	27	.0029	0.0000	.0014	.0192	.0150	.0121	-90.2	-90.2	-90.3	10.489	-179.9
15	28	.0088	0.0000	.0041	.0126	.0105	.0089	-90.3	-90.4	-90.5	5.380	-179.9
15	29	.0147	0.0000	.0068	.0090	.0077	.0067	-90.5	-90.6	-90.7	3.420	-179.9
16	30	.0236	0.0000	.0110	.0068	.0053	.0041	-90.7	-90.9	-91.2	1.962	-179.9
17	31	.0419	0.0000	.0195	.0044	.0030	.0019	-91.1	-91.5	-92.1	.897	179.7
18	32	.0724	0.0000	.0339	.0021	.0010	.0000	-91.9	-92.4	-84.8	.504	178.1
		0.0000	0.0000	0.0000	GAP 10			GAP 10			14.314	.1
19	33	-.0029	0.0000	-.0014	.0192	.0150	.0121	89.8	89.8	89.7	10.489	.1
19	34	-.0088	0.0000	-.0041	.0126	.0105	.0089	89.7	89.6	89.5	5.380	.1
19	35	-.0147	0.0000	-.0068	.0090	.0077	.0067	89.5	89.4	89.3	3.420	.1
20	36	-.0236	0.0000	-.0110	.0068	.0053	.0041	89.3	89.1	88.8	1.962	.1
21	37	-.0419	0.0000	-.0195	.0044	.0030	.0019	88.9	88.5	87.9	.897	-.3
22	38	-.0724	0.0000	-.0339	.0021	.0010	.0000	88.1	87.6	95.2	.504	-1.9

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	3.482	-3404.835	.000000	.000294	0.000	0.000	.943	-3404.838	1000.000	0.0
2	3.482	-3404.835	.000000	.000294	0.000	0.000	.943	-3404.838	1000.000	-180.0
3					INFINITE	INFINITE	-99.902	3.123	3.161	41.6
6					INFINITE	INFINITE	-99.902	3.123	3.161	-138.4
9					INFINITE	INFINITE	.000	.000	.000	-68.5
10					INFINITE	INFINITE	-.000	-.000	.000	-68.5
4					INFINITE	INFINITE	-600.000	.000	4.733	157.6
7					INFINITE	INFINITE	-600.000	.000	4.733	-22.4

INPUT POWER = .601 WATTS
RADIATED POWER = -.386 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = .987 WATTS
RADIATION EFFICIENCY = -64.30 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

A-11

		COORDINATES			CURRENT DISTRIBUTION						NORMAL ELECTRIC FIELD * RADIUS	
		X	Y	Z	AMPLITUDE			PHASE				
WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1			165.422	-.9
1	1	0.0000	0.0000	.0032	.2776	.2244	.1770	89.0	89.0	89.0	148.321	-.9
1	2	0.0000	0.0000	.0097	.1797	.1354	.0915	89.0	89.0	89.0	130.145	-1.0
1	3	0.0000	0.0000	.0162	.0930	.0479	.0000	89.0	89.0	-91.2	137.154	-1.0
		0.0000	0.0000	.0000	GAP 2			GAP 2			165.422	-.9
2	4	0.0000	0.0000	.0032	.2776	.2244	.1770	89.0	89.0	89.0	148.321	-.9
2	5	0.0000	0.0000	.0097	.1797	.1354	.0915	89.0	89.0	89.0	130.145	-1.0
2	6	0.0000	0.0000	.0162	.0930	.0479	.0000	89.0	89.0	-91.2	137.154	-1.0
		0.0000	-.0000	-.0000	GAP 3			GAP 3			48.523	179.6
3	7	0.0000	.0028	.0016	.1385	.1244	.1149	-91.0	-91.1	-91.2	34.748	179.8
3	8	0.0000	.0084	.0049	.1166	.1102	.1050	-91.2	-91.3	-91.4	17.096	-179.3
3	9	0.0000	.0140	.0081	.1054	.1012	.0976	-91.4	-91.6	-91.7	11.406	-178.4
4	10	0.0000	.0226	.0130	.0980	.0923	.0876	-91.7	-92.0	-92.3	7.506	-176.9
5	11	0.0000	.0400	.0231	.0885	.0814	.0752	-92.2	-92.9	-93.7	4.739	-174.3
6	12	0.0000	.0774	.0447	.0765	.0653	.0536	-93.6	-95.6	-98.3	3.815	-172.9
7	13	0.0000	.1158	.0669	.0539	.0477	.0414	-98.2	-100.1	-102.6	4.191	-174.3
7	14	0.0000	.1415	.0817	.0414	.0349	.0284	-102.4	-105.9	-111.4	4.560	-174.2
		0.0000	.1543	.0891			GAP 4			GAP 4	4.741	-173.7
		0.0000	.1543	.0891	GAP 5			GAP 5			4.202	155.7
8	15	0.0000	.1672	.0965	.0284	.0217	.0148	-111.4	-110.8	-110.3	4.377	157.5
8	16	0.0000	.1928	.1113	.0150	.0077	.0000	-110.6	-110.5	73.8	4.838	159.4
		0.0000	-.0000	.0000	GAP 6						48.523	179.6

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
9	17	0.0000	.0028	-.0016	.1385	.1244	.1149	-91.0	-91.1	-91.2	34.748	179.8
9	18	0.0000	.0084	-.0049	.1166	.1102	.1050	-91.2	-91.3	-91.4	17.096	-179.3
9	19	0.0000	.0140	-.0081	.1054	.1012	.0976	-91.4	-91.6	-91.7	11.406	-178.4
10	20	0.0000	.0226	-.0130	.0980	.0923	.0876	-91.7	-92.0	-92.3	7.506	-176.9
11	21	0.0000	.0400	-.0231	.0885	.0814	.0752	-92.2	-92.9	-93.7	4.739	-174.3
12	22	0.0000	.0774	-.0447	.0765	.0653	.0536	-93.6	-95.6	-98.3	3.815	-172.9
13	23	0.0000	.1158	-.0669	.0539	.0477	.0414	-98.2	-100.1	-102.6	4.191	-174.3
13	24	0.0000	.1415	-.0817	.0414	.0349	.0284	-102.4	-105.9	-111.4	4.560	-174.2
		0.0000	.1543	-.0891		GAP 7				GAP 7	4.741	-173.7
		0.0000	.1543	-.0891	GAP 8			GAP 8			4.202	155.7
14	25	0.0000	.1672	-.0965	.0284	.0217	.0148	-111.4	-110.8	-110.3	4.377	157.5
14	26	0.0000	.1928	-.1113	.0150	.0077	.0000	-110.6	-110.5	73.8	4.838	159.4
		0.0000	0.0000	0.0000	GAP 9			GAP 9			39.973	178.3
15	27	.0029	0.0000	.0014	.0007	.0107	.0176	-68.7	86.8	87.4	26.947	178.3
15	28	.0088	0.0000	.0041	.0160	.0201	.0229	87.3	87.4	87.5	10.195	178.1
15	29	.0147	0.0000	.0068	.0226	.0245	.0258	87.5	87.5	87.6	4.698	177.9
16	30	.0236	0.0000	.0110	.0255	.0266	.0266	87.5	87.5	87.5	.796	177.0
17	31	.0419	0.0000	.0195	.0258	.0231	.0190	87.5	87.4	87.4	2.423	-2.1
18	32	.0724	0.0000	.0339	.0184	.0100	.0000	87.3	87.2	-94.2	4.358	-2.7
		0.0000	0.0000	0.0000	GAP 10			GAP 10			39.973	178.3
19	33	-.0029	0.0000	-.0014	.0007	.0107	.0176	-68.7	86.8	87.4	26.947	178.3
19	34	-.0088	0.0000	-.0041	.0160	.0201	.0229	87.3	87.4	87.5	10.195	178.1
19	35	-.0147	0.0000	-.0068	.0226	.0245	.0258	87.5	87.5	87.6	4.698	177.9
20	36	-.0236	0.0000	-.0110	.0255	.0266	.0266	87.5	87.5	87.5	.796	177.0
21	37	-.0419	0.0000	-.0195	.0258	.0231	.0190	87.5	87.4	87.4	2.423	-2.1
22	38	-.0724	0.0000	-.0339	.0184	.0100	.0000	87.3	87.2	-94.2	4.358	-2.7

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	DEGREES
1	62.502	-3601.781	.000005	.000278	0.000	0.000	62.316	-3601.787	1000.000	0.0
2	62.502	-3601.781	.000005	.000278	0.000	0.000	62.316	-3601.787	1000.000	0.0
3					INFINITE	INFINITE	-99.902	3.123	13.840	87.2
6					INFINITE	INFINITE	-99.902	3.123	13.840	87.2
9					INFINITE	INFINITE	-.000	68233.630	48.748	21.5
10					INFINITE	INFINITE	-.000	68233.630	48.748	21.5
4					INFINITE	INFINITE	-600.000	-.000	17.021	-111.4
7					INFINITE	INFINITE	-600.000	-.000	17.021	-111.4

INPUT POWER = 9.633 WATTS
RADIATED POWER = .011 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 9.622 WATTS
RADIATION EFFICIENCY = .11 PER CENT

FREQUENCY = .3690 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 283

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 10.7 PER CENT FOR GAPS 9 AND 3

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	500.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	500.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	*700000.0000	-0.0000	-0.0000	-0.0000
10	IMP	2- 0	*700000.0000	-0.0000	-0.0000	-0.0000

NET NO	NETTYPE	GAP CONNECTIONS		PARAM1	PARAM2	PARAM3	PARAM4
11	IMP.	1	2	.700000.0000	-0.0000	-0.0000	-0.0000

	COORDINATES			CURRENT DISTRIBUTION				NORMAL ELECTRIC FIELD * RADIUS	
	X	Y	Z	AMPLITUDE		PHASE			
WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1						185.624	-.0
								GAP 1				
1	1	0.0000	0.0000	.0038	.3492	.2792	.2184	90.0	90.0	90.0	162.594	-.0
1	2	0.0000	0.0000	.0115	.2226	.1669	.1123	90.0	90.0	90.0	137.014	-.0
1	3	0.0000	0.0000	.0192	.1144	.0587	.0000	90.0	90.0	90.0	142.097	-.0
		0.0000	0.0000	0.0000	GAP 2						185.624	180.0
								GAP 2				
2	4	0.0000	0.0000	.0038	.3492	.2792	.2184	-90.0	-90.0	-90.0	162.594	180.0
2	5	0.0000	0.0000	.0115	.2226	.1669	.1123	-90.0	-90.0	-90.0	137.014	180.0
2	6	0.0000	0.0000	.0192	.1144	.0587	.0000	-90.0	-90.0	-90.0	142.097	180.0
		0.0000	0.0000	0.0000	GAP 3						19.897	179.3
								GAP 3				
3	7	0.0000	0.0033	.0019	.0200	.0163	.0152	-139.9	-158.4	-174.9	14.365	179.1
3	8	0.0000	0.0100	.0058	.0153	.0151	.0154	-172.1	175.9	166.5	7.081	178.2
3	9	0.0000	0.0166	.0096	.0153	.0158	.0163	167.1	160.1	154.7	4.411	176.7
4	10	0.0000	0.0268	.0155	.0162	.0171	.0178	155.4	148.1	143.1	2.409	172.9
5	11	0.0000	0.0475	.0274	.0175	.0181	.0183	144.5	138.8	134.8	.927	154.6
6	12	0.0000	0.0918	.0530	.0179	.0167	.0145	136.1	131.0	126.2	.605	80.8
7	13	0.0000	0.1374	.0794	.0144	.0130	.0115	126.4	123.7	120.3	.894	58.2
7	14	0.0000	0.1679	.0969	.0115	.0098	.0080	120.5	116.0	109.4	1.072	53.5
		0.0000	0.1831	.1057			GAP 4			GAP 4	1.152	52.4
								GAP 5				
		0.0000	0.1831	.1057	GAP 5						.943	16.7
8	15	0.0000	0.1983	.1145	.0080	.0062	.0043	109.4	109.9	110.2	1.016	18.4
8	16	0.0000	0.2288	.1321	.0043	.0022	.0000	109.9	109.8	109.4	1.171	19.9
		0.0000	0.0000	.0000	GAP 6						19.897	-.7
								GAP 6				
9	17	0.0000	0.0033	.0019	.0200	.0163	.0152	40.1	21.6	5.1	14.365	-.9
9	18	0.0000	0.0100	.0058	.0153	.0151	.0154	7.9	-4.1	-13.5	7.081	-1.8
9	19	0.0000	0.0166	.0096	.0153	.0158	.0163	-12.9	-19.9	-25.3	4.411	-3.3
10	20	0.0000	0.0268	.0155	.0162	.0171	.0178	-24.6	-31.9	-36.9	2.409	-7.1
11	21	0.0000	0.0475	.0274	.0175	.0181	.0183	-35.5	-41.2	-45.2	.927	-25.4
12	22	0.0000	0.0918	.0530	.0179	.0167	.0145	-43.9	-49.0	-53.8	.605	-99.2
13	23	0.0000	0.1374	.0794	.0144	.0130	.0115	-53.6	-56.3	-59.7	.894	-121.8
13	24	0.0000	0.1679	.0969	.0115	.0098	.0080	-59.5	-64.0	-70.6	1.072	-126.5
		0.0000	0.1831	.1057			GAP 7			GAP 7	1.152	-127.6
								GAP 8				
		0.0000	0.1831	.1057	GAP 8						.943	-163.3
14	25	0.0000	0.1983	.1145	.0080	.0062	.0043	-70.6	-70.1	-69.8	1.016	-161.6
14	26	0.0000	0.2288	.1321	.0043	.0022	.0000	-70.1	-70.2	-70.6	1.171	-160.1
		0.0000	0.0000	0.0000	GAP 9						14.308	-179.9
								GAP 9				
15	27	.0035	0.0000	.0016	.0226	.0176	.0142	-89.6	-89.5	-89.4	10.485	-179.9
15	28	.0104	0.0000	.0049	.0147	.0123	.0104	-89.4	-89.3	-89.2	5.374	-179.9
15	29	.0174	0.0000	.0081	.0105	.0090	.0078	-89.2	-89.1	-89.0	3.413	-179.9
16	30	.0280	0.0000	.0131	.0079	.0061	.0047	-89.0	-88.8	-88.5	1.952	-179.7
17	31	.0497	0.0000	.0232	.0051	.0034	.0021	-88.6	-88.3	-87.8	.884	-179.3
18	32	.0859	0.0000	.0402	.0024	.0011	.0000	-88.0	-87.6	-93.6	.484	-178.0

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 10			GAP 10			14.308	.1
19	33	-.0035	0.0000	-.0016	.0226	.0176	.0142	90.4	90.5	90.6	10.485	.1
19	34	-.0104	0.0000	-.0049	.0147	.0123	.0104	90.6	90.7	90.8	5.374	.1
19	35	-.0174	0.0000	-.0081	.0105	.0090	.0078	90.8	90.9	91.0	3.413	.1
20	36	-.0280	0.0000	-.0131	.0079	.0061	.0047	91.0	91.2	91.5	1.952	.3
21	37	-.0497	0.0000	-.0232	.0051	.0034	.0021	91.4	91.7	92.2	.884	.7
22	38	-.0859	0.0000	-.0402	.0024	.0011	.0000	92.0	92.4	86.4	.484	2.0

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	1.787	-2863.452	.000000	.000349	0.000	0.000	.594	-2863.453	1000.000	0.0
2	1.787	-2863.452	.000000	.000349	0.000	0.000	.594	-2863.453	1000.000	-180.0
3					INFINITE	INFINITE	-99.863	3.704	2.000	38.0
6					INFINITE	INFINITE	-99.863	3.704	2.000	-142.0
9					INFINITE	INFINITE	.000	.000	.000	-54.6
0					INFINITE	INFINITE	-.000	-.000	.000	-54.6
4					INFINITE	INFINITE	-600.000	.000	4.794	109.4
7					INFINITE	INFINITE	-600.000	0.000	4.794	-70.6

INPUT POWER = .436 WATTS
RADIATED POWER = .168 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = .604 WATTS
RADIATION EFFICIENCY = 38.61 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	CURRENT DISTRIBUTION AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	NORMAL ELECTRIC FIELD * RADIUS VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			166.286	-1.1
1	1	0.0000	0.0000	-.0038	.3326	.2691	.2124	88.7	88.7	88.7	149.380	-1.2
1	2	0.0000	0.0000	.0115	.2157	.1626	.1099	88.7	88.7	88.7	131.521	-1.3
1	3	0.0000	0.0000	.0192	.1117	.0575	.0000	88.7	88.7	88.4	138.839	-1.3
		0.0000	0.0000	0.0000	GAP 2			GAP 2			166.286	-1.1
2	4	0.0000	0.0000	-.0038	.3326	.2691	.2124	88.7	88.7	88.7	149.380	-1.2
2	5	0.0000	0.0000	-.0115	.2157	.1626	.1099	88.7	88.7	88.7	131.521	-1.3
2	6	0.0000	0.0000	-.0192	.1117	.0575	.0000	88.7	88.7	88.4	138.839	-1.3
		0.0000	-.0000	.0000	GAP 3			GAP 3			47.645	179.7
3	7	0.0000	.0033	.0019	.1660	.1497	.1388	-91.3	-91.5	-91.6	33.842	-179.9
3	8	0.0000	.0100	.0058	.1408	.1336	.1279	-91.6	-91.8	-92.0	16.169	-178.4
3	9	0.0000	.0166	.0096	.1283	.1237	.1199	-91.9	-92.1	-92.3	10.513	-176.7
4	10	0.0000	.0268	.0155	.1203	.1143	.1094	-92.3	-92.7	-93.2	6.708	-173.9
5	11	0.0000	.0475	.0274	.1104	.1032	.0968	-93.1	-94.1	-95.1	4.191	-169.3
6	12	0.0000	.0918	.0530	.0984	.0862	.0721	-95.1	-97.7	-101.1	3.800	-169.2
7	13	0.0000	.1374	.0794	.0725	.0647	.0564	-101.1	-103.4	-106.3	4.665	-173.4
7	14	0.0000	.1679	.0969	.0565	.0478	.0390	-106.2	-110.4	-116.9	5.325	-174.5
		0.0000	.1831	.1057			GAP 4			GAP 4	5.633	-174.4
		0.0000	.1831	.1057	GAP 5			GAP 5			4.747	149.6
8	15	0.0000	.1983	.1145	.0390	.0300	.0205	-116.9	-116.2	-115.7	5.023	151.7
8	16	0.0000	.2288	.1321	.0208	.0107	.0000	-116.0	-115.9	-112.3	5.657	154.0
		0.0000	-.0000	.0000	GAP 6			GAP 6			47.645	179.7
9	17	0.0000	.0033	-.0019	.1660	.1497	.1388	-91.3	-91.5	-91.6	33.842	-179.9
9	18	0.0000	.0100	-.0058	.1408	.1336	.1279	-91.6	-91.8	-92.0	16.169	-178.4
9	19	0.0000	.0166	-.0096	.1283	.1237	.1199	-91.9	-92.1	-92.3	10.513	-176.7
10	20	0.0000	.0268	-.0155	.1203	.1143	.1094	-92.3	-92.7	-93.2	6.708	-173.9
11	21	0.0000	.0475	-.0274	.1104	.1032	.0968	-93.1	-94.1	-95.1	4.191	-169.3
12	22	0.0000	.0918	-.0530	.0984	.0862	.0721	-95.1	-97.7	-101.1	3.800	-169.2
13	23	0.0000	.1374	-.0794	.0725	.0647	.0564	-101.1	-103.4	-106.3	4.665	-173.4
13	24	0.0000	.1679	-.0969	.0565	.0478	.0390	-106.2	-110.4	-116.9	5.325	-174.5
		0.0000	.1831	-.1057			GAP 7			GAP 7	5.633	-174.4
		0.0000	.1831	-.1057	GAP 8			GAP 8			4.747	149.6
14	25	0.0000	.1983	-.1145	.0390	.0300	.0205	-116.9	-116.2	-115.7	5.023	151.7
14	26	0.0000	.2288	-.1321	.0208	.0107	.0000	-116.0	-115.9	-112.3	5.657	154.0
		0.0000	0.0000	0.0000	GAP 9			GAP 9			41.703	177.6
15	27	.0035	0.0000	.0016	.0007	.0135	.0221	-54.1	85.7	86.4	28.195	177.6
15	28	.0104	0.0000	.0049	.0202	.0253	.0289	86.3	86.5	86.6	10.809	177.3
15	29	.0174	0.0000	.0081	.0285	.0309	.0326	86.6	86.6	86.6	5.079	-176.9

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
16	30	.0280	0.0000	.0131	.0321	.0336	.0337	86.6	86.6	86.6	.965	175.3
17	31	.0497	0.0000	.0232	.0328	.0296	.0243	86.5	86.4	86.3	2.523	-2.8
18	32	.0859	0.0000	.0402	.0236	.0129	.0000	86.3	86.1	-95.8	4.725	-3.7
		0.0000	0.0000	0.0000	GAP 10			GAP 10			41.703	177.6
19	33	-.0035	0.0000	-.0016	.0007	.0135	.0221	-54.1	85.7	86.4	28.195	177.6
19	34	-.0104	0.0000	-.0049	.0202	.0253	.0289	86.3	86.5	86.6	10.809	177.3
19	35	-.0174	0.0000	-.0081	.0285	.0309	.0326	86.6	86.6	86.6	5.079	176.9
20	36	-.0280	0.0000	-.0131	.0321	.0336	.0337	86.6	86.6	86.6	.965	175.3
21	37	-.0497	0.0000	-.0232	.0328	.0296	.0243	86.5	86.4	86.3	2.523	-2.8
22	38	-.0859	0.0000	-.0402	.0236	.0129	.0000	86.3	86.1	-95.8	4.725	-3.7

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	DEGREES
1	66.893	-3005.343	.000007	.000333	0.000	0.000	66.599	-3005.356	1000.000	0.(
2	66.893	-3005.343	.000007	.000333	0.000	0.000	66.599	-3005.356	1000.000	0.(
3					INFINITE	INFINITE	-99.863	3.704	16.593	86.5
6					INFINITE	INFINITE	-99.863	3.704	16.593	86.5
9					INFINITE	INFINITE	-.000	57508.561	40.876	35.4
10					INFINITE	INFINITE	-.000	57508.561	40.876	35.4
4					INFINITE	INFINITE	-600.000	.000	23.392	-116.5
7					INFINITE	INFINITE	-600.000	-.000	23.392	-116.5

INPUT POWER = 14.805 WATTS
RADIATED POWER = .079 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 14.726 WATTS
RADIATION EFFICIENCY = .53 PER CENT

FREQUENCY = .4500 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 284

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 30.7 PER CENT FOR GAPS 9 AND 3

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	0.00	-0.0000	0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	*800000.0000	-0.0000	-0.0000	-0.0000
10	IMP	2- 0	*800000.0000	-0.0000	-0.0000	-0.0000
11	IMP	1- 2	*400000.0000	-0.0000	-0.0000	-0.0000

		COORDINATES			CURRENT DISTRIBUTION						NORMAL ELECTRIC FIELD * RADIUS	
		X	Y	Z	AMPLITUDE			PHASE				
IRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1			185.674	-.0
1	1	0.0000	0.0000	.0047	.4274	.3419	.2676	90.0	90.0	90.0	162.841	-.0
1	2	0.0000	0.0000	.0141	.2727	.2046	.1377	90.0	90.0	90.0	137.558	-.0
1	3	0.0000	0.0000	.0234	.1402	.0720	.0000	90.0	90.0	-90.1	142.866	-.0
		0.0000	0.0000	.0000	GAP 2			GAP 2			185.674	180.0
2	4	0.0000	0.0000	-.0047	.4274	.3419	.2676	-90.0	-90.0	-90.0	162.841	180.0
2	5	0.0000	0.0000	-.0141	.2727	.2046	.1377	-90.0	-90.0	-90.0	137.558	180.0

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE X	AMPLITUDE Y	AMPLITUDE Z	PHASE X DEG	PHASE Y DEG	PHASE Z DEG	VOLTS	DEG
2	6	0.0000	0.0000	-.0234	.1402	.0720	.0000	-90.0	-90.0	89.9	142.866	180.0
		0.0000	0.0000	0.0000	GAP 3			GAP 3			20.125	178.7
3	7	0.0000	.0041	.0023	.0221	.0138	.0084	-101.5	-107.8	-118.8	14.558	178.5
3	8	0.0000	.0122	.0070	.0092	.0058	.0039	-116.0	-132.0	-162.0	7.226	177.5
3	9	0.0000	.0203	.0117	.0040	.0037	.0046	-159.2	164.0	138.9	4.539	176.3
4	10	0.0000	.0326	.0189	.0044	.0065	.0083	141.6	119.2	110.4	2.519	173.5
5	11	0.0000	.0579	.0334	.0077	.0098	.0111	112.0	103.7	99.1	.973	163.3
6	12	0.0000	.1119	.0646	.0104	.0108	.0100	99.8	93.0	86.8	.263	83.8
7	13	0.0000	.1676	.0968	.0099	.0091	.0082	86.9	83.4	79.2	.476	27.6
7	14	0.0000	.2047	.1182	.0082	.0070	.0058	79.4	73.9	65.7	.640	18.1
		0.0000	.2233	.1289			GAP 4			GAP 4	.713	15.6
		0.0000	.2233	.1289	GAP 5			GAP 5			.525	-28.1
8	15	0.0000	.2419	.1396	.0058	.0046	.0032	65.7	66.4	66.8	.590	-25.6
8	16	0.0000	.2790	.1611	.0032	.0017	.0000	66.3	66.3	65.8	.714	-23.7
		0.0000	0.0000	0.0000	GAP 6			GAP 6			20.125	-1.3
9	17	0.0000	.0041	-.0023	.0221	.0138	.0084	78.5	72.2	61.2	14.558	-1.5
9	18	0.0000	.0122	-.0070	.0092	.0058	.0039	64.0	48.0	18.0	7.226	-2.5
9	19	0.0000	.0203	-.0117	.0040	.0037	.0046	20.8	-16.0	-41.1	4.539	-3.7
10	20	0.0000	.0326	-.0189	.0044	.0065	.0083	-38.4	-60.8	-69.6	2.519	-6.5
11	21	0.0000	.0579	-.0334	.0077	.0098	.0111	-68.0	-76.3	-80.9	.973	-16.7
12	22	0.0000	.1119	-.0646	.0104	.0108	.0100	-80.2	-87.0	-93.2	.263	-96.2
13	23	0.0000	.1676	-.0968	.0099	.0091	.0082	-93.1	-96.6	-100.8	.476	-152.4
13	24	0.0000	.2047	-.1182	.0082	.0070	.0058	-100.6	-106.1	-114.3	.640	-161.9
		0.0000	.2233	-.1289			GAP 7			GAP 7	.713	-164.4
		0.0000	.2233	-.1289	GAP 8			GAP 8			.525	151.9
14	25	0.0000	.2419	-.1396	.0058	.0046	.0032	-114.3	-113.6	-113.2	.590	154.4
14	26	0.0000	.2790	-.1611	.0032	.0017	.0000	-113.7	-113.7	-114.2	.714	156.3
		0.0000	0.0000	0.0000	GAP 9			GAP 9			14.301	-179.9
15	27	.0042	0.0000	.0020	.0279	.0218	.0176	-88.3	-87.9	-87.5	10.482	-179.9
15	28	.0127	0.0000	.0059	.0182	.0153	.0129	-87.5	-87.1	-86.6	5.375	-179.8
15	29	.0212	0.0000	.0099	.0131	.0113	.0098	-86.7	-86.2	-85.7	3.416	-179.6
16	30	.0342	0.0000	.0160	.0100	.0077	.0060	-85.8	-84.8	-83.7	1.959	-179.0
17	31	.0606	0.0000	.0283	.0065	.0044	.0028	-84.1	-82.4	-80.5	.902	-176.9
18	32	.1047	0.0000	.0490	.0032	.0015	.0000	-81.5	-79.9	-62.0	.522	-171.5
		0.0000	0.0000	0.0000	GAP 10			GAP 10			14.301	.1
19	33	-.0042	0.0000	-.0020	.0279	.0218	.0176	91.7	92.1	92.5	10.482	.1
19	34	-.0127	0.0000	-.0059	.0182	.0153	.0129	92.5	92.9	93.4	5.375	.2
19	35	-.0212	0.0000	-.0099	.0131	.0113	.0098	93.3	93.8	94.3	3.416	.4
20	36	-.0342	0.0000	-.0160	.0100	.0077	.0060	94.2	95.2	96.3	1.959	1.0
21	37	-.0606	0.0000	-.0283	.0065	.0044	.0028	95.9	97.6	99.5	.902	3.1
22	38	-.1047	0.0000	-.0490	.0032	.0015	.0000	98.5	100.1	-118.0	.522	8.5

	OHMS	OHMS	MHOS	MHOS	OHMS	OHMS	OHMS	OHMS	VOLT	DEGREES
1	1.225	-2339.848	.000000	.000427	0.000	0.000	1.019	-2339.849	1000.000	0.0
2	1.225	-2339.848	.000000	.000427	0.000	0.000	1.019	-2339.849	1000.000	-180.0
3					INFINITE	INFINITE	-99.796	4.515	2.205	75.9
6					INFINITE	INFINITE	-99.796	4.515	2.205	-104.1
9					INFINITE	INFINITE	.000	.000	.000	-14.0
10					INFINITE	INFINITE	-.000	-.000	.000	-14.0
4					INFINITE	INFINITE	-600.000	.000	3.484	65.7
7					INFINITE	INFINITE	-600.000	.000	3.484	-114.3

INPUT POWER = .448 WATTS
RADIATED POWER = .097 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = .351 WATTS
RADIATION EFFICIENCY = 21.63 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

		COORDINATES			CURRENT DISTRIBUTION					NORMAL ELECTRIC FIELD * RADIUS	
		X	Y	Z	AMPLITUDE			PHASE		VOLTS	DEG
WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG		
		0.0000	0.0000	-.0000	GAP 1			GAP 1			168.013	-1.6
1	1	0.0000	0.0000	.0047	.4135	.3351	.2649	88.1	88.1	88.1	151.469	-1.7
1	2	0.0000	0.0000	.0141	.2688	.2028	.1371	88.1	88.1	88.0	134.201	-1.9

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
1	3	0.0000	0.0000	.0234	.1395	.0718	.0000	88.0	88.0	-92.5	142.111	-2.0
		0.0000	0.0000	.0000	GAP 2			GAP 2			168.013	-1.6
2	4	0.0000	0.0000	-.0047	.4135	.3351	.2649	88.1	88.1	88.1	151.469	-1.7
2	5	0.0000	0.0000	-.0141	.2688	.2028	.1371	88.1	88.1	88.0	134.201	-1.9
2	6	0.0000	0.0000	-.0234	.1395	.0718	.0000	88.0	88.0	-92.5	142.111	-2.0
		0.0000	0.0000	0.0000	GAP 3			GAP 3			45.894	-179.7
3	7	0.0000	.0041	.0023	.2067	.1876	.1753	-92.0	-92.2	-92.5	32.031	-178.8
3	8	0.0000	.0122	.0070	.1778	.1699	.1639	-92.5	-92.8	-93.2	14.327	-175.0
3	9	0.0000	.0203	.0117	.1644	.1597	.1560	-93.2	-93.5	-93.9	8.766	-170.4
4	10	0.0000	.0326	.0189	.1566	.1511	.1469	-93.9	-94.6	-95.4	5.222	-161.9
5	11	0.0000	.0579	.0334	.1482	.1426	.1374	-95.4	-97.0	-98.6	3.311	-149.8
6	12	0.0000	.1119	.0646	.1394	.1278	.1106	-98.6	-102.4	-107.1	3.870	-159.9
7	13	0.0000	.1676	.0968	.1111	.1003	.0883	-107.0	-110.0	-113.8	5.732	-173.0
7	14	0.0000	.2047	.1182	.0884	.0754	.0619	-113.6	-118.9	-126.9	7.043	-176.9
		0.0000	.2233	.1289			GAP 4			GAP 4	7.636	-177.8
		0.0000	.2233	.1289	GAP 5			GAP 5			5.914	138.7
8	15	0.0000	.2419	.1396	.0619	.0480	.0331	-126.9	-126.0	-125.4	6.435	141.4
8	16	0.0000	.2790	.1611	.0335	.0174	.0000	-125.9	-125.7	-123.0	7.484	144.1
		0.0000	0.0000	0.0000	GAP 6			GAP 6			45.894	-179.7
9	17	0.0000	.0041	-.0023	.2067	.1876	.1753	-92.0	-92.2	-92.5	32.031	-178.8
9	18	0.0000	.0122	-.0070	.1778	.1699	.1639	-92.5	-92.8	-93.2	14.327	-175.0
9	19	0.0000	.0203	-.0117	.1644	.1597	.1560	-93.2	-93.5	-93.9	8.766	-170.4
10	20	0.0000	.0326	-.0189	.1566	.1511	.1469	-93.9	-94.6	-95.4	5.222	-161.9
11	21	0.0000	.0579	-.0334	.1482	.1426	.1374	-95.4	-97.0	-98.6	3.311	-149.8
12	22	0.0000	.1119	-.0646	.1394	.1278	.1106	-98.6	-102.4	-107.1	3.870	-159.9
13	23	0.0000	.1676	-.0968	.1111	.1003	.0883	-107.0	-110.0	-113.8	5.732	-173.0
13	24	0.0000	.2047	-.1182	.0884	.0754	.0619	-113.6	-118.9	-126.9	7.043	-176.9
		0.0000	.2233	-.1289			GAP 7			GAP 7	7.636	-177.8
		0.0000	.2233	-.1289	GAP 8			GAP 8			5.914	138.7
14	25	0.0000	.2419	-.1396	.0619	.0480	.0331	-126.9	-126.0	-125.4	6.435	141.4
14	26	0.0000	.2790	-.1611	.0335	.0174	.0000	-125.9	-125.7	-123.0	7.484	144.1
		0.0000	0.0000	0.0000	GAP 9			GAP 9			45.207	175.9
15	27	.0042	0.0000	.0020	.0008	.0185	.0300	-14.4	83.4	84.3	30.727	175.8
15	28	.0127	0.0000	.0059	.0275	.0344	.0393	84.1	84.4	84.4	12.063	175.3
15	29	.0212	0.0000	.0099	.0388	.0422	.0445	84.4	84.4	84.4	5.863	174.5
16	30	.0342	0.0000	.0160	.0440	.0463	.0466	84.4	84.3	84.2	1.322	171.3
17	31	.0606	0.0000	.0283	.0454	.0414	.0343	84.2	83.9	83.7	2.720	-4.4
18	32	.1047	0.0000	.0490	.0334	.0183	.0000	83.7	83.3	80.7	5.482	-6.3
		0.0000	0.0000	0.0000	GAP 10			GAP 10			45.207	175.9
19	33	-.0042	0.0000	-.0020	.0008	.0185	.0300	-14.4	83.4	84.3	30.727	175.8
19	34	-.0127	0.0000	-.0059	.0275	.0344	.0393	84.1	84.4	84.4	12.063	175.3
19	35	-.0212	0.0000	-.0099	.0388	.0422	.0445	84.4	84.4	84.4	5.863	174.5
20	36	-.0342	0.0000	-.0160	.0440	.0463	.0466	84.4	84.3	84.2	1.322	171.3
21	37	-.0606	0.0000	-.0283	.0454	.0414	.0343	84.2	83.9	83.7	2.720	-4.4
22	38	-.1047	0.0000	-.0490	.0334	.0183	.0000	83.7	83.3	80.7	5.482	-6.3

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	78.731	-2417.007	.000013	.000413	0.000	0.000	78.191	-2417.042	1000.000	0.0
2	78.731	-2417.007	.000013	.000413	0.000	0.000	78.191	-2417.042	1000.000	0.0
3					INFINITE	INFINITE	-99.796	4.515	20.646	85.4
6					INFINITE	INFINITE	-99.796	4.515	20.646	85.4
9					INFINITE	INFINITE	-.000	47157.020	38.199	75.9
10					INFINITE	INFINITE	-.000	47157.020	38.199	75.9
4					INFINITE	INFINITE	-600.000	-.000	37.136	-126.9
7					INFINITE	INFINITE	-600.000	-.000	37.136	-126.9

INPUT POWER = 26.925 WATTS
RADIATED POWER = .496 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 26.429 WATTS
RADIATION EFFICIENCY = 1.84 PER CENT

FREQUENCY = .5400 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 285

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 46.1 PER CENT FOR GAPS 9 AND 6

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NO.	NETYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	3090000.0000	-0.0000	-0.0000	-0.0000
10	IMP	2- 0	3090000.0000	-0.0000	-0.0000	-0.0000
11	IMP	1- 2	8540000.0000	-0.0000	-0.0000	-0.0000

WIRE NO	INT. NO	COORDINATES X WAVELENGTHS	Y WAVELENGTHS	Z WAVELENGTHS	CURRENT DISTRIBUTION AMPLITUDE			PHASE			NORMAL ELECTRIC FIELD * RADIUS VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			185.689	-.0
1	1	0.0000	0.0000	.0056	.5152	.4124	.3231	90.0	90.0	90.0	163.134	-.0
1	2	0.0000	0.0000	.0169	.3292	.2471	.1664	90.0	90.0	90.0	138.268	-.0
1	3	0.0000	0.0000	.0281	.1694	.0870	.0000	90.0	90.0	90.1	143.884	-.0
		0.0000	0.0000	0.0000	GAP 2			GAP 2			185.689	180.0
2	4	0.0000	0.0000	-.0056	.5152	.4124	.3231	-90.0	-90.0	-90.0	163.134	180.0
2	5	0.0000	0.0000	-.0169	.3292	.2471	.1664	-90.0	-90.0	-90.0	138.268	180.0
2	6	0.0000	0.0000	-.0281	.1694	.0870	.0000	-90.0	-90.0	89.9	143.884	180.0
		0.0000	0.0000	0.0000	GAP 3			GAP 3			20.160	178.1
3	7	0.0000	.0049	.0028	.0331	.0229	.0159	-95.1	-96.5	-98.2	14.589	177.7
3	8	0.0000	.0146	.0084	.0171	.0123	.0086	-97.8	-99.5	-101.9	7.252	176.4
3	9	0.0000	.0243	.0141	.0088	.0059	.0035	-101.6	-105.0	-111.3	4.570	174.7
4	10	0.0000	.0392	.0227	.0038	.0008	.0025	-109.5	-175.2	97.7	2.561	171.3
5	11	0.0000	.0695	.0401	.0018	.0047	.0067	101.3	83.6	78.6	1.039	160.9
6	12	0.0000	.1343	.0776	.0058	.0073	.0074	77.1	68.3	60.6	.231	108.0
7	13	0.0000	.2011	.1162	.0072	.0069	.0063	60.2	55.8	50.7	.277	14.3
7	14	0.0000	.2457	.1419	.0063	.0055	.0046	50.8	44.1	34.2	.424	-4.0
		0.0000	.2680	.1547			GAP 4			GAP 4	.492	-8.6
		0.0000	.2680	.1547	GAP 5			GAP 5			.313	-61.6
8	15	0.0000	.2902	.1676	.0046	.0037	.0026	34.2	35.1	35.7	.374	-57.7
8	16	0.0000	.3348	.1933	.0026	.0014	.0000	35.1	35.0	36.2	.486	-54.9
		0.0000	0.0000	0.0000	GAP 6			GAP 6			20.160	-1.9
9	17	0.0000	.0049	-.0028	.0331	.0229	.0159	84.9	83.5	81.8	14.589	-2.3

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
9	18	0.0000	.0146	-.0084	.0171	.0123	.0086	82.2	80.5	78.1	7.252	-3.6
9	19	0.0000	.0243	-.0141	.0088	.0059	.0035	78.4	75.0	68.7	4.570	-5.3
10	20	0.0000	.0392	-.0227	.0038	.0008	.0025	70.5	4.8	-82.3	2.561	-8.7
11	21	0.0000	.0695	-.0401	.0018	.0047	.0067	-78.7	-96.4	-101.4	1.039	-19.1
12	22	0.0000	.1343	-.0776	.0058	.0073	.0074	-102.9	-111.7	-119.4	.231	-72.0
13	23	0.0000	.2011	-.1162	.0072	.0069	.0063	-119.8	-124.2	-129.3	.277	-165.7
13	24	0.0000	.2457	-.1419	.0063	.0055	.0046	-129.2	-135.9	-145.8	.424	176.0
		0.0000	.2680	-.1547			GAP 7			GAP 7	.492	171.4
		0.0000	.2680	-.1547	GAP 8			GAP 8			.313	118.4
14	25	0.0000	.2902	-.1676	.0046	.0037	.0026	-145.8	-144.9	-144.3	.374	122.3
14	26	0.0000	.3348	-.1933	.0026	.0014	.0000	-144.9	-145.0	-143.8	.486	125.1
		0.0000	0.0000	0.0000	GAP 9			GAP 9			14.310	-179.8
15	27	.0051	0.0000	.0024	.0342	.0270	.0219	-87.0	-86.2	-85.4	10.493	-179.8
15	28	.0153	0.0000	.0071	.0227	.0191	.0163	-85.5	-84.8	-84.0	5.388	-179.6
15	29	.0255	0.0000	.0119	.0165	.0143	.0125	-84.0	-83.2	-82.3	3.433	-179.2
16	30	.0410	0.0000	.0191	.0128	.0100	.0080	-82.5	-80.8	-79.1	1.984	-178.2
17	31	.0727	0.0000	.0339	.0086	.0060	.0040	-79.8	-77.3	-74.6	.948	-174.3
18	32	.1257	0.0000	.0588	.0044	.0021	.0000	-76.0	-74.0	8.4	.603	-166.0
		0.0000	0.0000	0.0000	GAP 10			GAP 10			14.310	.2
19	33	-.0051	0.0000	-.0024	.0342	.0270	.0219	93.0	93.8	94.6	10.493	.2
19	34	-.0153	0.0000	-.0071	.0227	.0191	.0163	94.5	95.2	96.0	5.388	.4
19	35	-.0255	0.0000	-.0119	.0165	.0143	.0125	96.0	96.8	97.7	3.433	.8
20	36	-.0410	0.0000	-.0191	.0128	.0100	.0080	97.5	99.2	100.9	1.984	1.8
21	37	-.0727	0.0000	-.0339	.0086	.0060	.0040	100.2	102.7	105.4	.948	5.7
22	38	-.1257	0.0000	-.0588	.0044	.0021	.0000	104.0	106.0	-171.6	.603	14.0

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	1.373	-1941.111	.000000	.000515	0.000	0.000	1.306	-1941.111	1000.000	0.0
2	1.373	-1941.111	.000000	.000515	0.000	0.000	1.306	-1941.111	1000.000	-180.0
3					INFINITE	INFINITE	-99.706	5.413	3.301	81.8
6					INFINITE	INFINITE	-99.706	5.413	3.301	-98.2
9					INFINITE	INFINITE	-.000	.000	.000	22.5
10					INFINITE	INFINITE	.000	-.000	.000	22.5
4					INFINITE	INFINITE	-600.000	.000	2.753	34.2
7					INFINITE	INFINITE	-600.000	.000	2.753	-145.8

INPUT POWER = .729 WATTS
RADIATED POWER = .207 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = .522 WATTS
RADIATION EFFICIENCY = 28.38 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

	COORDINATES			CURRENT DISTRIBUTION						NORMAL ELECTRIC FIELD * RADIUS	
	X	Y	Z	AMPLITUDE			PHASE				
INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
	0.0000	0.0000	0.0000	GAP 1			GAP 1			170.820	-2.6
1 1	0.0000	0.0000	.0056	.5113	.4154	.3289	86.8	86.7	86.6	154.832	-2.8
1 2	0.0000	0.0000	.0169	.3337	.2521	.1706	86.6	86.6	86.5	138.484	-3.3
1 3	0.0000	0.0000	.0281	.1735	.0894	.0000	86.5	86.5	-94.8	147.331	-3.5
	0.0000	0.0000	0.0000	GAP 2			GAP 2			170.820	-2.6
2 4	0.0000	0.0000	-.0056	.5113	.4154	.3289	86.8	86.7	86.6	154.832	-2.8
2 5	0.0000	0.0000	-.0169	.3337	.2521	.1706	86.6	86.6	86.5	138.484	-3.3
2 6	0.0000	0.0000	-.0281	.1735	.0894	.0000	86.5	86.5	-94.8	147.331	-3.5
	0.0000	0.0000	0.0000	GAP 3			GAP 3			43.100	-177.2
3 7	0.0000	.0049	.0028	.2561	.2350	.2222	-93.4	-94.1	-94.8	29.701	-174.4
3 8	0.0000	.0146	.0084	.2252	.2177	.2125	-94.8	-95.5	-96.3	11.815	-161.2
3 9	0.0000	.0243	.0141	.2131	.2096	.2072	-96.2	-97.0	-97.8	6.999	-143.2
4 10	0.0000	.0392	.0227	.2079	.2055	.2045	-97.8	-99.4	-100.9	4.925	-116.1
5 11	0.0000	.0695	.0401	.2061	.2070	.2072	-100.9	-103.9	-106.9	4.390	-100.9
6 12	0.0000	.1343	.0776	.2099	.2049	.1852	-106.7	-112.7	-119.3	4.706	-142.5
7 13	0.0000	.2011	.1162	.1859	.1705	.1518	-119.2	-123.1	-128.0	7.953	-176.4
7 14	0.0000	.2457	.1419	.1521	.1309	.1085	-127.8	-134.2	-143.9	10.566	174.5
	0.0000	.2680	.1547			GAP 4			GAP 4	11.748	172.0
	0.0000	.2680	.1547	GAP 5			GAP 5			8.117	120.5
8 15	0.0000	.2902	.1676	.1085	.0852	.0593	-143.9	-142.9	-142.3	9.197	124.1
8 16	0.0000	.3348	.1933	.0599	.0313	.0000	-142.8	-142.7	-145.3	11.172	127.2
	0.0000	0.0000	0.0000	GAP 6			GAP 6			43.100	-177.2

06/18/70

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
9	17	0.0000	.0049	-.0028	.2561	.2350	.2222	-93.4	-94.1	-94.8	29.201	-174.4
9	18	0.0000	.0146	-.0084	.2252	.2177	.2125	-94.8	-95.5	-96.3	11.815	-161.2
9	19	0.0000	.0243	-.0141	.2131	.2096	.2072	-96.2	-97.0	-97.8	6.999	-143.2
10	20	0.0000	.0392	-.0227	.2079	.2055	.2045	-97.8	-99.4	-100.9	4.925	-116.1
11	21	0.0000	.0695	-.0401	.2061	.2070	.2072	-100.9	-103.9	-106.9	4.390	-100.9
12	22	0.0000	.1343	-.0776	.2099	.2049	.1852	-106.7	-112.7	-119.3	4.706	-142.5
13	23	0.0000	.2011	-.1162	.1859	.1705	.1518	-119.2	-123.1	-128.0	7.953	-176.4
13	24	0.0000	.2457	-.1419	.1521	.1309	.1085	-127.8	-134.2	-143.9	10.566	174.5
		0.0000	.2680	-.1547			GAP 7			GAP 7	11.748	172.0
		0.0000	.2680	-.1547	GAP 8			GAP 8			8.117	120.5
14	25	0.0000	.2902	-.1676	.1085	.0852	.0593	-143.9	-142.9	-142.3	9.197	124.1
14	26	0.0000	.3348	-.1933	.0599	.0313	.0000	-142.8	-142.7	-145.3	11.172	127.2
		0.0000	0.0000	0.0000	GAP 9			GAP 9			51.225	171.5
15	27	.0051	0.0000	.0024	.0020	.0265	.0424	22.3	77.8	79.0	35.094	171.2
15	28	.0153	0.0000	.0071	.0390	.0487	.0557	78.7	79.0	79.1	14.261	170.0
15	29	.0255	0.0000	.0119	.0551	.0600	.0636	79.0	79.0	78.9		168.4
16	30	.0410	0.0000	.0191	.0629	.0667	.0676			78.4		.5
17	31	.0727	0.0000		.0660	.0610	.0511	78.4	77.8	77.4	3.	
18	32	.1257	0.0000		.0499	.0277		77.3	76.6	72.2	6.83	
		0.0000	0.000		AP 10			GAP 10			51.225	
19	33	-.0051	0.0		.0020		.0424	22.3	77.8	79.0	35.094	1.
19	34	-.0153	0.0			87	.0557	78.7	79.0	79.1	14.261	170.0
19	35	-.0255	0.0		31		.0636	79.0	79.0	7		.4
20	36	-.0410	0.0		.0629	.0667	.0676	78.9	78			
21	37	-.0727	0.0	9	.0660	.0610	.0511	78.4				
22	38	-.1257	0.0000	.0088	.0499	.0277				72.2	6.837	-14.7

IMPEDAN

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GA RESIST. OHMS	GA REACT. OHMS	GAP V	GREES
1	110.565	-1952.766	.000029	.000510	0.000	0.000	109.334	-1952.905	1000.000	0.0
2	110.565	-1952.766	.000029	.000510	0.000	0.000	109.334	-1952.905	1000.000	0.0
3					INFINITE	INFINITE	-99.706	5.413	25.568	83.5
6					INFINITE	INFINITE	-99.706	5.413	25.568	83.5
9					INFINITE	INFINITE	-.000	39297.517	77.315	112.5
10					INFINITE	INFINITE	-.000	39297.517	77.315	112.5
4					INFINITE	INFINITE	-600.000	-.000	65.114	-143.9
7					INFINITE	INFINITE	-600.000	-.000	65.114	-143.9

INPUT POWER	=	57.804 WATTS
RADIATED POWER	=	2.742 WATTS
WIRE LOSS	=	.000 WATTS
NETWORK LOSS	=	55.062 WATTS
RADIATION EFFICIENCY	=	4.74 PER CENT

FREQUENCY = .7000 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 286

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 9.7 PER CENT FOR GAPS 4 AND 10

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	513000.0000	-0.0000	-0.0000	-0.0000
10	IMP	2- 0	513000.0000	-0.0000	-0.0000	-0.0000

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
11	IMP	1 2	*0400.00.0000	=0.0000	=0.0000	=0.0000

		COORDINATES			CURRENT DISTRIBUTION			NORMAL ELECTRIC FIELD * RADIUS				
		X	Y	Z	AMPLITUDE			PHASE				
WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			185.700	-.1
1	1	0.0000	0.0000	.0073	.6745	.5411	.4246	89.9	89.9	89.9	163.778	-.1
1	2	0.0000	0.0000	.0219	.4326	.3252	.2191	89.9	89.9	89.9	139.867	-.1
1	3	0.0000	0.0000	.0364	.2231	.1147	.0000	89.9	89.9	89.8	146.187	-.1
		0.0000	0.0000	0.0000	GAP 2			GAP 2			185.700	179.9
2	4	0.0000	0.0000	-.0073	.6745	.5411	.4246	-90.1	-90.1	-90.1	163.778	179.9
2	5	0.0000	0.0000	-.0219	.4326	.3252	.2191	-90.1	-90.1	-90.1	139.867	179.9
2	6	0.0000	0.0000	-.0364	.2231	.1147	.0000	-90.1	-90.1	-90.2	146.187	179.9
		0.0000	0.0000	0.0000	GAP 3			GAP 3			20.105	177.3
3	7	0.0000	.0063	.0037	.0474	.0342	.0253	-97.6	-99.4	-101.4	14.536	176.7
3	8	0.0000	.0189	.0110	.0268	.0207	.0159	-100.9	-102.7	-104.7	7.191	174.7
3	9	0.0000	.0315	.0183	.0162	.0125	.0094	-104.4	-106.6	-109.2	4.508	172.1
4	10	0.0000	.0508	.0294	.0098	.0054	.0021	-108.4	-114.1	-127.3	2.506	166.6
5	11	0.0000	.0901	.0520	.0030	.0009	.0035	-115.8	64.1	56.9	1.028	150.3
6	12	0.0000	.1741	.1006	.0025	.0052	.0062	42.4	31.1	20.4	.293	96.7
7	13	0.0000	.2607	.1506	.0061	.0061	.0058	18.8	12.7	5.8	.200	-1.5
7	14	0.0000	.3185	.1839	.0058	.0052	.0045	5.8	-3.2	-16.1	.335	-38.1
		0.0000	.3474	.2006			GAP 4			GAP 4	.409	-46.8
		0.0000	.3474	.2006	GAP 5			GAP 5			.189	-118.5
8	15	0.0000	.3762	.2172	.0045	.0037	.0027	-16.1	-14.6	-13.7	.262	-109.7
8	16	0.0000	.4340	.2505	.0027	.0014	.0000	-14.6	-14.6	165.5	.390	-104.6
		0.0000	0.0000	0.0000	GAP 6			GAP 6			20.105	-2.7
9	17	0.0000	.0063	-.0037	.0474	.0342	.0253	82.4	80.6	78.6	14.536	-3.3
9	18	0.0000	.0189	-.0110	.0268	.0207	.0159	79.1	77.3	75.3	7.191	-5.3
9	19	0.0000	.0315	-.0183	.0162	.0125	.0094	75.6	73.4	70.8	4.508	-7.9
10	20	0.0000	.0508	-.0294	.0098	.0054	.0021	71.6	65.9	52.7	2.506	-13.4
11	21	0.0000	.0901	-.0520	.0030	.0009	.0035	64.2	-115.9	-123.1	1.028	-29.7
12	22	0.0000	.1741	-.1006	.0025	.0052	.0062	-137.6	-148.9	-159.6	.293	-83.3
13	23	0.0000	.2607	-.1506	.0061	.0061	.0058	-161.2	-167.3	-174.2	.200	178.5
13	24	0.0000	.3185	-.1839	.0058	.0052	.0045	-174.2	176.8	163.9	.335	141.9
		0.0000	.3474	-.2006			GAP 7			GAP 7	.409	133.2
		0.0000	.3474	-.2006	GAP 8			GAP 8			.189	61.5
14	25	0.0000	.3762	-.2172	.0045	.0037	.0027	163.9	165.4	166.3	.262	70.3
14	26	0.0000	.4340	-.2505	.0027	.0014	.0000	165.4	165.4	-14.5	.390	75.4
		0.0000	0.0000	0.0000	GAP 9			GAP 9			14.337	-179.8
15	27	.0066	0.0000	.0031	.0542	.0449	.0384	-81.8	-80.1	-78.5	10.547	-179.6
15	28	.0198	0.0000	.0092	.0393	.0348	.0311	-78.8	-77.4	-76.0	5.488	-179.0
15	29	.0330	0.0000	.0154	.0314	.0285	.0260	-76.1	-74.9	-73.7	3.586	-177.8
16	30	.0532	0.0000	.0248	.0264	.0226	.0196	-73.9	-71.9	-70.0	2.227	-174.7
17	31	.0942	0.0000	.0440	.0203	.0158	.0116	-70.8	-68.5	-66.6	1.382	-166.3
18	32	.1629	0.0000	.0763	.0122	.0063	.0000	-67.7	-66.5	139.2	1.303	-157.7

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 10			GAP 10			14.337	.2
19	33	-.0066	0.0000	-.0031	.0542	.0449	.0384	98.2	99.9	101.5	10.547	.4
19	34	-.0198	0.0000	-.0092	.0393	.0348	.0311	101.2	102.6	104.0	5.488	1.0
19	35	-.0330	0.0000	-.0154	.0314	.0285	.0260	103.9	105.1	106.3	3.586	2.2
20	36	-.0532	0.0000	-.0248	.0264	.0226	.0196	106.1	108.1	110.0	2.227	5.3
21	37	-.0942	0.0000	-.0440	.0203	.0158	.0116	109.2	111.5	113.4	1.382	13.7
22	38	-.1629	0.0000	-.0763	.0122	.0063	.0000	112.3	113.5	-40.8	1.303	22.3

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	1.570	-1482.440	.000001	.000675	0.000	0.000	1.512	-1482.440	1000.000	0.0
2	1.570	-1482.440	.000001	.000675	0.000	0.000	1.512	-1482.440	1000.000	-180.0
3					INFINITE	INFINITE	-99.507	7.002	4.726	78.4
6					INFINITE	INFINITE	-99.507	7.002	4.726	-101.6
9					INFINITE	INFINITE	.000	.000	.000	.7
10					INFINITE	INFINITE	-.000	-.000	.000	.7
4					INFINITE	INFINITE	-600.000	.000	2.697	-16.1
7					INFINITE	INFINITE	-600.000	-.000	2.697	163.9

INPUT POWER = 1.429 WATTS
RADIATED POWER = .434 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = .994 WATTS
RADIATION EFFICIENCY = 30.40 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

WIRE NO	INT NO	COORDINATES X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	CURRENT DISTRIBUTION AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	NORMAL ELECTRIC FIELD @ RADIUS VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			169.319	-6.9
1	1	0.0000	0.0000	.0073	.6620	.5387	.4272	80.3	79.8	79.4	153.925	-8.0
1	2	0.0000	0.0000	.0219	.4334	.3277	.2220	79.6	79.3	79.1	138.513	-10.0
1	3	0.0000	0.0000	.0364	.2257	.1164	.0000	79.1	79.0	73.9	147.871	-10.9
		0.0000	0.0000	0.0000	GAP 2			GAP 2			169.319	-6.9
2	4	0.0000	0.0000	-.0073	.6620	.5387	.4272	80.3	79.8	79.4	153.925	-8.0
2	5	0.0000	0.0000	-.0219	.4334	.3277	.2220	79.6	79.3	79.1	138.513	-10.0
2	6	0.0000	0.0000	-.0364	.2257	.1164	.0000	79.1	79.0	73.9	147.871	-10.9
		0.0000	0.0000	0.0000	GAP 3			GAP 3			46.415	-163.6
3	7	0.0000	.0063	.0037	.3317	.3056	.2907	-100.3	-103.3	-106.4	34.544	-154.5
3	8	0.0000	.0189	.0110	.2944	.2868	.2827	-106.3	-109.5	-112.7	22.518	-129.5
3	9	0.0000	.0315	.0183	.2835	.2822	.2827	-112.7	-115.9	-119.1	20.664	-117.3
4	10	0.0000	.0508	.0294	.2836	.2896	.2993	-119.0	-125.2	-130.8	19.852	-110.4
5	11	0.0000	.0901	.0520	.3012	.3273	.3536	-130.7	-140.4	-148.5	17.982	-112.5
6	12	0.0000	.1741	.1006	.3566	.3966	.3920	-148.2	-161.6	-173.2	12.257	-148.7
7	13	0.0000	.2607	.1506	.3932	.3719	.3393	-173.1	-179.2	173.7	14.387	147.9
7	14	0.0000	.3185	.1839	.3402	.2983	.2526	174.0	165.0	152.1	20.451	125.7
		0.0000	.3474	.2006			GAP 4			GAP 4	23.413	119.3
		0.0000	.3474	.2006	GAP 5			GAP 5			12.499	54.1
8	15	0.0000	.3762	.2172	.2526	.2035	.1441	152.1	153.3	154.0	15.689	59.5
8	16	0.0000	.4340	.2505	.1456	.0768	.0000	153.3	153.4	-25.8	21.014	63.3
		0.0000	0.0000	0.0000	GAP 6			GAP 6			46.415	-163.6
9	17	0.0000	.0063	-.0037	.3317	.3056	.2907	-100.3	-103.3	-106.4	34.544	-154.5
9	18	0.0000	.0189	-.0110	.2944	.2868	.2827	-106.3	-109.5	-112.7	22.518	-129.5
9	19	0.0000	.0315	-.0183	.2835	.2822	.2827	-112.7	-115.9	-119.1	20.664	-117.3
10	20	0.0000	.0508	-.0294	.2836	.2896	.2993	-119.0	-125.2	-130.8	19.852	-110.4
11	21	0.0000	.0901	-.0520	.3012	.3273	.3536	-130.7	-140.4	-148.5	17.982	-112.5
12	22	0.0000	.1741	-.1006	.3566	.3966	.3920	-148.2	-161.6	-173.2	12.257	-148.7
13	23	0.0000	.2607	-.1506	.3932	.3719	.3393	-173.1	-179.2	173.7	14.387	147.9
13	24	0.0000	.3185	-.1839	.3402	.2983	.2526	174.0	165.0	152.1	20.451	125.7
		0.0000	.3474	-.2006			GAP 7			GAP 7	23.413	119.3
		0.0000	.3474	-.2006	GAP 8			GAP 8			12.499	54.1
14	25	0.0000	.3762	-.2172	.2526	.2035	.1441	152.1	153.3	154.0	15.689	59.5
14	26	0.0000	.4340	-.2505	.1456	.0768	.0000	153.3	153.4	-25.8	21.014	63.3
		0.0000	0.0000	0.0000	GAP 9			GAP 9			56.383	147.6
15	27	.0066	0.0000	.0031	.0079	.0413	.0645	.7	48.0	50.6	39.194	146.4
15	28	.0198	0.0000	.0092	.0599	.0748	.0858	49.9	50.4	50.3	16.969	141.5
15	29	.0330	0.0000	.0154	.0849	.0930	.0992	50.2	49.9	49.6	9.395	135.8

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
16	30	.0532	0.0000	.0248	.0982	.1056	.1085	49.4	48.5	47.6	3.455	121.0
17	31	.0942	0.0000	.0440	.1063	.1007	.0860	47.4	45.5	44.0	3.331	-28.9
18	32	.1629	0.0000	.0763	.0841	.0476	.0000	43.8	41.7	-152.3	8.943	-46.2
		0.0000	0.0000	0.0000	GAP 10			GAP 10			56.383	147.6
19	33	-.0066	0.0000	-.0031	.0079	.0413	.0645	.7	48.0	50.6	39.194	146.4
19	34	-.0198	0.0000	-.0092	.0599	.0748	.0858	49.9	50.4	50.3	16.969	141.5
19	35	-.0330	0.0000	-.0154	.0849	.0930	.0992	50.2	49.9	49.6	9.395	135.8
20	36	-.0532	0.0000	-.0248	.0982	.1056	.1085	49.4	48.5	47.6	3.455	121.0
21	37	-.0942	0.0000	-.0440	.1063	.1007	.0860	47.4	45.5	44.0	3.331	-28.9
22	38	-.1629	0.0000	-.0763	.0841	.0476	.0000	43.8	41.7	-152.3	8.943	-46.2

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	258.016	-1487.595	.000113	.000653	0.000	0.000	253.825	-1489.080	1000.000	0.0
2	258.016	-1487.595	.000113	.000653	0.000	0.000	253.825	-1489.080	1000.000	0.0
3					INFINITE	INFINITE	-99.507	7.002	33.091	75.6
6					INFINITE	INFINITE	-99.507	7.002	33.091	75.6
9					INFINITE	INFINITE	-.000	30315.227	238.045	90.7
0					INFINITE	INFINITE	-.000	30315.227	238.045	90.7
4					INFINITE	INFINITE	-600.000	-.000	151.584	152.1
7					INFINITE	INFINITE	-600.000	-.000	151.584	152.1

INPUT POWER = 226.378 WATTS
RADIATED POWER = 25.494 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 200.884 WATTS
RADIATION EFFICIENCY = 11.26 PER CENT

WIRE COORDINATES IN FEET AND WIRE RADII IN INCHES

WIRE NO	X1	Y1	Z1	RAD1		X2	Y2	Z2	RAD2	INTERVALS
1 GAP 1	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	61.5000	.250000	3
2 GAP 2	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	-61.5000	.250000	3
3 GAP 3	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	30.8000	.250000	3
4	-0.0000	53.2000	30.8000	.250000		-0.0000	89.6000	51.8000	.250000	1
5	-0.0000	89.6000	51.8000	.250000		-0.0000	163.7000	94.5000	.250000	1
6	-0.0000	163.7000	94.5000	.250000		-0.0000	325.9000	188.3000	.250000	2
7	-0.0000	325.9000	188.3000	.250000	GAP 4	-0.0000	488.4000	282.0000	.250000	2
8 GAP 5	-0.0000	488.4000	282.0000	.250000		-0.0000	650.8000	375.7000	.250000	2
9 GAP 6	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	-30.8000	.250000	3

WIRE NO		X1	Y1	Z1	RAD1		X2	Y2	Z2	RAD2	INTERVALS
10		-0.0000	53.2000	-30.8000	.250000		-0.0000	89.6000	-51.8000	.250000	1
11		-0.0000	89.6000	-51.8000	.250000		-0.0000	163.7000	-94.5000	.250000	1
12		-0.0000	163.7000	-94.5000	.250000		-0.0000	325.9000	-188.3000	.250000	2
13		-0.0000	325.9000	-188.3000	.250000	GAP 7	-0.0000	488.4000	-282.0000	.250000	2
14	GAP 8	-0.0000	488.4000	-282.0000	.250000		-0.0000	650.8000	-375.7000	.250000	2
15	GAP 9	-0.0000	-0.0000	-0.0000	.290000		55.7000	-0.0000	26.0000	.290000	3
16		55.7000	-0.0000	26.0000	.290000		93.8000	-0.0000	43.8000	.290000	1
17		93.8000	-0.0000	43.8000	.290000		171.2000	-0.0000	79.9000	.290000	1
18		171.2000	-0.0000	79.9000	.290000		286.9000	-0.0000	134.6000	.290000	1
19	GAP 10	-0.0000	-0.0000	-0.0000	.290000		-55.7000	-0.0000	-26.0000	.290000	3
20		-55.7000	-0.0000	-26.0000	.290000		-93.8000	-0.0000	-43.8000	.290000	1
21		-93.8000	-0.0000	-43.8000	.290000		-171.2000	-0.0000	-79.9000	.290000	1
22		-171.2000	-0.0000	-79.9000	.290000		-286.9000	-0.0000	-134.6000	.290000	1

FREQUENCY = .9000 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 287

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 42.6 PER CENT FOR GAPS 4 AND 9

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	464000.0000	-0.0000	-0.0000	-0.0000
10	IMP	2- 0	464000.0000	-0.0000	-0.0000	-0.0000
11	IMP	1- 2	-991000.0000	-0.0000	-0.0000	-0.0000

WIRE NO	INT NO	COORDINATES X WAVELENGTHS	COORDINATES Y WAVELENGTHS	COORDINATES Z WAVELENGTHS	CURRENT DISTRIBUTION AMPLITUDE			CURRENT DISTRIBUTION PHASE			NORMAL ELECTRIC FIELD * RADIUS VOLTS	NORMAL ELECTRIC FIELD * RADIUS DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1			185.718	-.1
1	1	0.0000	0.0000	.0094	.8820	.7099	.5586	89.9	89.9	89.9	164.862	-.1
1	2	0.0000	0.0000	.0281	.5689	.4285	.2892	89.9	89.9	89.9	142.571	-.1
1	3	0.0000	0.0000	.0469	.2945	.1515	.0000	89.9	89.9	-90.3	150.102	-.1
		0.0000	0.0000	.0000	GAP 2			GAP 2			185.718	179.9
2	4	0.0000	0.0000	-.0094	.8820	.7099	.5586	-90.1	-90.1	-90.1	164.862	179.9
2	5	0.0000	0.0000	-.0281	.5689	.4285	.2892	-90.1	-90.1	-90.1	142.571	179.9
2	6	0.0000	0.0000	-.0469	.2945	.1515	.0000	-90.1	-90.1	89.7	150.102	179.9
		0.0000	0.0000	0.0000	GAP 3			GAP 3			20.053	176.7
3	7	0.0000	.0081	.0047	.0577	.0410	.0297	-100.2	-102.9	-106.1	14.451	176.0
3	8	0.0000	.0243	.0141	.0316	.0239	.0181	-105.2	-108.2	-111.8	7.028	173.4
3	9	0.0000	.0405	.0235	.0185	.0139	.0104	-111.4	-115.4	-120.3	4.286	169.7
4	10	0.0000	.0653	.0378	.0109	.0058	.0026	-118.8	-130.2	-155.1	2.224	161.0
5	11	0.0000	.1158	.0669	.0034	.0004	.0029	-134.1	41.5	21.8	.758	124.8
6	12	0.0000	.1868	.1079	.0027	.0047	.0064	6.1	-4.4	-14.9	.450	61.3
6	13	0.0000	.2609	.1507	.0064	.0077	.0085	-17.0	-26.6	-35.7	.357	13.9
7	14	0.0000	.3352	.1936	.0085	.0088	.0086	-36.3	-45.6	-55.7	.326	-42.9
7	15	0.0000	.4094	.2364	.0087	.0081	.0073	-55.6	-67.9	-84.7	.480	-89.4
		0.0000	.4466	.2579			GAP 4			GAP 4	.587	-102.5
		0.0000	.4466	.2579	GAP 5			GAP 5			.175	157.2
8	16	0.0000	.4837	.2793	.0073	.0062	.0046	-84.7	-82.3	-80.9	.298	178.7
8	17	0.0000	.5580	.3221	.0047	.0025	.0000	-82.1	-82.0	-81.5	.528	-172.1
		0.0000	0.0000	0.0000	GAP 6			GAP 6			20.053	-3.3
9	18	0.0000	.0081	-.0047	.0577	.0410	.0297	79.8	77.1	73.9	14.451	-4.0
9	19	0.0000	.0243	-.0141	.0316	.0239	.0181	74.8	71.8	68.2	7.028	-6.6
9	20	0.0000	.0405	-.0235	.0185	.0139	.0104	68.6	64.6	59.7	4.286	-10.3
10	21	0.0000	.0653	-.0378	.0109	.0058	.0026	61.2	49.8	24.9	2.224	-19.0
11	22	0.0000	.1158	-.0669	.0034	.0004	.0029	45.9	-138.5	-158.2	.758	-55.2
12	23	0.0000	.1868	-.1079	.0027	.0047	.0064	-173.9	175.6	165.1	.450	-118.7
12	24	0.0000	.2609	-.1507	.0064	.0077	.0085	163.0	153.4	144.3	.357	-166.1
13	25	0.0000	.3352	-.1936	.0085	.0088	.0086	143.7	134.4	124.3	.326	137.1
13	26	0.0000	.4094	-.2364	.0087	.0081	.0073	124.4	112.1	95.3	.480	90.6
		0.0000	.4466	-.2579			GAP 7			GAP 7	.587	77.5

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
		0.0000	.4466	-.2579	GAP 8			GAP 8			.175	-22.8
14	27	0.0000	.4837	-.2793	.0073	.0062	.0046	95.3	97.7	99.1	.298	-1.3
14	28	0.0000	.5580	-.3221	.0047	.0025	.0000	97.9	98.0	98.5	.528	7.9
		0.0000	0.0000	0.0000	GAP 9			GAP 9			14.383	-179.7
15	29	.0085	0.0000	.0040	.0566	.0446	.0365	-101.2	-104.3	-107.6	10.553	-179.9
15	30	.0255	0.0000	.0119	.0377	.0321	.0277	-107.0	-110.0	-113.1	5.402	179.3
15	31	.0424	0.0000	.0198	.0280	.0246	.0218	-112.9	-116.0	-119.2	3.423	177.9
16	32	.0684	0.0000	.0319	.0222	.0182	.0152	-118.6	-124.3	-129.9	1.961	173.6
17	33	.1212	0.0000	.0566	.0160	.0120	.0086	-127.5	-134.4	-140.7	.975	156.9
18	34	.2094	0.0000	.0981	.0092	.0046	.0000	-136.6	-139.8	-154.4	.771	133.4
		0.0000	0.0000	0.0000	GAP 10			GAP 10			14.383	.3
19	35	-.0085	0.0000	-.0040	.0566	.0446	.0365	78.8	75.7	72.4	10.553	.1
19	36	-.0255	0.0000	-.0119	.0377	.0321	.0277	73.0	70.0	66.9	5.402	-.7
19	37	-.0424	0.0000	-.0198	.0280	.0246	.0218	67.1	64.0	60.8	3.423	-2.1
20	38	-.0684	0.0000	-.0319	.0222	.0182	.0152	61.4	55.7	50.1	1.961	-6.4
21	39	-.1212	0.0000	-.0566	.0160	.0120	.0086	52.5	45.6	39.3	.975	-23.1
22	40	-.2094	0.0000	-.0981	.0092	.0046	.0000	43.4	40.2	25.6	.771	-46.6

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	DEGREES
1	1.801	-1133.772	.000001	.000882	0.000	0.000	1.625	-1133.772	1000.000	0.0
2	1.801	-1133.772	.000001	.000882	0.000	0.000	1.625	-1133.772	1000.000	-180.0
3					INFINITE	INFINITE	-99.188	8.974	5.750	74.7
6					INFINITE	INFINITE	-99.188	8.974	5.750	-105.3
9					INFINITE	INFINITE	.000	.000	.000	-23.1
10					INFINITE	INFINITE	-.000	-.000	.000	-23.1
4					INFINITE	INFINITE	-600.000	-.000	4.352	-84.7
7					INFINITE	INFINITE	-600.000	-.000	4.352	95.3

INPUT POWER = 2.802 WATTS
RADIATED POWER = 1.079 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 1.723 WATTS
RADIATION EFFICIENCY = 38.52 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

		COORDINATES			CURRENT DISTRIBUTION						NORMAL ELECTRIC FIELD * RADIUS	
		X	Y	Z	AMPLITUDE			PHASE				
WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1			162.468	-6.3
1	1	0.0000	0.0000	.0094	.8067	.6548	.5184	81.4	81.0	80.7	146.990	-7.2
1	2	0.0000	0.0000	.0281	.5265	.3978	.2691	80.8	80.6	80.4	131.187	-8.8
1	3	0.0000	0.0000	.0469	.2737	.1410	.0000	80.5	80.3	-104.1	139.533	-9.5
		0.0000	0.0000	.0000	GAP 2			GAP 2			162.468	-6.3
2	4	0.0000	0.0000	-.0094	.8067	.6548	.5184	81.4	81.0	80.7	146.990	-7.2
2	5	0.0000	0.0000	-.0281	.5265	.3978	.2691	80.8	80.6	80.4	131.187	-8.8
2	6	0.0000	0.0000	-.0469	.2737	.1410	.0000	80.5	80.3	-104.1	139.533	-9.5
		0.0000	0.0000	0.0000	GAP 3			GAP 3			51.589	-169.7
3	7	0.0000	.0081	.0047	.4022	.3609	.3324	-99.2	-101.8	-104.8	39.971	-164.7
3	8	0.0000	.0243	.0141	.3371	.3170	.3007	-104.6	-107.8	-111.3	26.503	-152.5
3	9	0.0000	.0405	.0235	.3016	.2882	.2770	-111.3	-115.0	-119.0	23.529	-147.3
4	10	0.0000	.0653	.0378	.2780	.2611	.2504	-118.9	-127.7	-137.3	22.054	-146.1
5*	11	0.0000	.1158	.0669	.2524	.2482	.2612	-137.0	-156.7	-175.0	20.691	-153.2
6	12	0.0000	.1868	.1079	.2618	.2864	.3121	-174.7	168.5	154.8	17.889	-172.1
6	13	0.0000	.2609	.1507	.3122	.3312	.3390	154.9	143.4	133.1	14.208	156.0
7	14	0.0000	.3352	.1936	.3392	.3332	.3136	133.1	123.1	112.3	13.583	110.6
7	15	0.0000	.4094	.2364	.3149	.2836	.2488	112.7	99.8	82.6	17.986	74.1
		0.0000	.4466	.2579			GAP 4			GAP 4	20.653	62.5
		0.0000	.4466	.2579	GAP 5			GAP 5			7.010	-21.3
8	16	0.0000	.4837	.2793	.2488	.2088	.1520	82.6	84.1	84.9	10.946	-10.9
8	17	0.0000	.5580	.3221	.1536	.0823	.0000	84.0	84.0	83.9	17.322	-6.0
		0.0000	0.0000	0.0000	GAP 6			GAP 6			51.589	-169.7
9	18	0.0000	.0081	-.0047	.4022	.3609	.3324	-99.2	-101.8	-104.8	39.971	-164.7
9	19	0.0000	.0243	-.0141	.3371	.3170	.3007	-104.6	-107.8	-111.3	26.503	-152.5
9	20	0.0000	.0405	-.0235	.3016	.2882	.2770	-111.3	-115.0	-119.0	23.529	-147.3
10	21	0.0000	.0653	-.0378	.2780	.2611	.2504	-118.9	-127.7	-137.3	22.054	-146.1
11	22	0.0000	.1158	-.0669	.2524	.2482	.2612	-137.0	-156.7	-175.0	20.691	-153.2
12	23	0.0000	.1868	-.1079	.2618	.2864	.3121	-174.7	168.5	154.8	17.889	-172.1
12	24	0.0000	.2609	-.1507	.3122	.3312	.3390	154.9	143.4	133.1	14.208	156.0

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
13	25	0.0000	.3352	-.1936	.3392	.3332	.3136	133.1	123.1	112.3	13.583	110.6
13	26	0.0000	.4094	-.2364	.3149	.2836	.2488	112.7	99.8	82.6	17.986	74.1
		0.0000	.4466	-.2579		// GAP 7				GAP 7	20.653	62.5
		0.0000	.4466	-.2579	GAP 8			GAP 8			7.010	-21.3
14	27	0.0000	.4837	-.2793	.2488	.2088	.1520	82.6	84.1	84.9	10.946	-10.9
14	28	0.0000	.5580	-.3221	.1536	.0823	.0000	84.0	84.0	83.9	17.322	-6.0
		0.0000	0.0000	0.0000	GAP 9			GAP 9			43.241	145.9
15	29	.0085	0.0000	.0040	.0091	.0388	.0615	-23.2	41.9	45.8	30.028	144.1
15	30	.0255	0.0000	.0119	.0570	.0716	.0824	44.6	45.4	45.3	12.971	136.7
15	31	.0424	0.0000	.0198	.0815	.0895	.0956	45.1	44.7	44.1	7.222	128.3
16	32	.0684	0.0000	.0319	.0946	.1019	.1048	43.9	42.5	41.1	2.810	107.3
17	33	.1212	0.0000	.0566	.1027	.0973	.0827	40.7	37.9	35.7	2.667	-29.8
18	34	.2094	0.0000	.0981	.0809	.0452	.0000	35.6	32.6	24.2	6.756	-54.4
		0.0000	0.0000	0.0000	GAP 10			GAP 10			43.241	145.9
19	35	-.0085	0.0000	-.0040	.0091	.0388	.0615	-23.2	41.9	45.8	30.028	144.1
19	36	-.0255	0.0000	-.0119	.0570	.0716	.0824	44.6	45.4	45.3	12.971	136.7
19	37	-.0424	0.0000	-.0198	.0815	.0895	.0956	45.1	44.7	44.1	7.222	128.3
20	38	-.0684	0.0000	-.0319	.0946	.1019	.1048	43.9	42.5	41.1	2.810	107.3
21	39	-.1212	0.0000	-.0566	.1027	.0973	.0827	40.7	37.9	35.7	2.667	-29.8
22	40	-.2094	0.0000	-.0981	.0809	.0452	.0000	35.6	32.6	24.2	6.756	-54.4

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	187.614	-1224.911	.000122	.000798	0.000	0.000	184.452	-1225.894	1000.000	0.0
2	187.614	-1224.911	.000122	.00798	0.000	0.000	184.452	-1225.894	1000.000	0.0
3					INFINITE	INFINITE	-99.188	8.974	40.056	75.6
6					INFINITE	INFINITE	-99.188	8.974	40.056	75.6
9					INFINITE	INFINITE	-.000	23578.510	215.068	66.8
0					INFINITE	INFINITE	-.000	23578.510	215.068	66.8
4					INFINITE	INFINITE	-600.000	.000	149.260	82.6
7					INFINITE	INFINITE	-600.000	.000	149.260	82.6

INPUT POWER = 244.351 WATTS
RADIATED POWER = 27.336 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 217.015 WATTS
RADIATION EFFICIENCY = 11.19 PER CENT

FREQUENCY = .9950 NC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 288

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 21.6 PER CENT FOR GAPS 9. AND 3

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	419000.0000	-0.0000	-0.0000	-0.0000
10	IMP	2- 0	419000.0000	-0.0000	-0.0000	-0.0000
11	IMP	1- 2	-889000.0000	-0.0000	-0.0000	-0.0000

WIRE NO	INT NO	COORDINATES X WAVELENGTHS	COORDINATES Y WAVELENGTHS	COORDINATES Z WAVELENGTHS	CURRENT DISTRIBUTION AMPLITUDE			CURRENT DISTRIBUTION PHASE DEG			NORMAL ELECTRIC FIELD * RADIUS VOLTS	NORMAL ELECTRIC FIELD * RADIUS DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			185.745	-.1
1	1	0.0000	0.0000	.0104	.9846	.7940	.6257	89.9	89.9	89.9	165.502	-.1
1	2	0.0000	0.0000	.0311	.6372	.4805	.3246	89.9	89.9	89.9	144.148	-.1
1	3	0.0000	0.0000	.0518	.3305	.1701	.0000	89.9	89.9	-90.4	152.381	-.1
		0.0000	0.0000	0.0000	GAP 2			GAP 2			185.745	179.9
2	4	0.0000	-.0104	.9846	.7940	.6257		-90.1	-90.1	-90.1	165.502	179.9
2	5	0.0000	-.0311	.6372	.4805	.3246		-90.1	-90.1	-90.1	144.148	179.9
2	6	0.0000	-.0518	.3305	.1701	.0000		-90.1	-90.1	89.6	152.381	179.9
		0.0000	0.0000	0.0000	GAP 3			GAP 3			20.106	176.4
3	7	0.0000	.0090	.0052	.0617	.0430	.0305	-97.9	-99.6	-101.6	14.470	175.8
3	8	0.0000	.0269	.0156	.0326	.0241	.0175	-101.0	-102.7	-104.6	6.978	173.1
3	9	0.0000	.0448	.0259	.0180	.0129	.0089	-104.2	-106.1	-108.0	4.186	169.5
4	10	0.0000	.0722	.0418	.0096	.0040	.0006	-106.9	-107.4	-66.3	2.061	160.8
5	11	0.0000	.1280	.0739	.0021	.0027	.0045	-84.7	.0	-1.9	.532	113.8
6	12	0.0000	.2065	.1192	.0046	.0064	.0079	-13.5	-26.6	-40.3	.441	20.8
6	13	0.0000	.2885	.1667	.0080	.0093	.0103	-42.1	-54.6	-66.3	.452	-24.4
7	14	0.0000	.3705	.2140	.0103	.0108	.0106	-66.8	-78.2	-90.3	.439	-75.0
7	15	0.0000	.4527	.2614	.0107	.0101	.0092	-90.1	-104.5	-123.4	.601	-121.3
		0.0000	.4937	.2851			GAP 4			GAP 4	.719	-135.8
		0.0000	.4937	.2851	GAP 5			GAP 5			.172	108.4
8	16	0.0000	.5348	.3088	.0092	.0081	.0061	-123.4	-120.7	-119.2	.325	138.7
8	17	0.0000	.6169	.3561	.0061	.0034	.0009	-120.5	-120.3	60.9	.626	149.5
		0.0000	0.0000	0.0000	GAP 6			GAP 6			20.106	-3.6
9	18	0.0000	.0090	-.0052	.0617	.0430	.0305	82.1	80.4	78.4	14.470	-4.2
9	19	0.0000	.0269	-.0156	.0326	.0241	.0175	79.0	77.3	75.4	6.978	-6.9
9	20	0.0000	.0448	-.0259	.0180	.0129	.0089	75.8	73.9	72.0	4.186	-10.5
10	21	0.0000	.0722	-.0418	.0096	.0040	.0006	73.1	72.6	113.7	2.061	-19.2
11	22	0.0000	.1280	-.0739	.0021	.0027	.0045	95.3	-180.0	178.1	.532	-66.2
12	23	0.0000	.2065	-.1192	.0046	.0064	.0079	166.5	153.4	139.7	.441	-159.2
12	24	0.0000	.2885	-.1667	.0080	.0093	.0103	137.9	125.4	113.7	.452	155.6
13	25	0.0000	.3705	-.2140	.0103	.0108	.0106	113.2	101.8	89.7	.439	105.0
13	26	0.0000	.4527	-.2614	.0107	.0101	.0092	89.9	75.5	56.6	.601	58.7
		0.0000	.4937	-.2851			GAP 7			GAP 7	.719	44.2
		0.0000	.4937	-.2851	GAP 8			GAP 8			.172	-71.6
14	27	0.0000	.5348	-.3088	.0092	.0081	.0061	56.6	59.3	60.8	.325	-41.3
14	28	0.0000	.6169	-.3561	.0061	.0034	.0000	59.5	59.7	-119.1	.626	-30.5
		-.0000	0.0000	-.0000	GAP 9			GAP 9			14.405	-179.7
15	29	.0094	0.0000	.0044	.0622	.0489	.0398	-99.0	-101.5	-104.3	10.569	-179.9
15	30	.0282	0.0000	.0131	.0411	.0348	.0299	-103.8	-106.3	-108.9	5.404	179.5
15	31	.0469	0.0000	.0219	.0302	.0263	.0232	-108.7	-111.3	-114.0	3.417	178.2
16	32	.0756	0.0000	.0353	.0237	.0191	.0157	-113.5	-118.5	-123.4	1.948	174.6
17	33	.1339	0.0000	.0625	.0167	.0122	.0085	-121.2	-127.2	-132.8	.951	160.5
18	34	.2316	0.0000	.1084	.0094	.0046	.0000	-128.6	-130.8	-105.8	.711	141.4
		.0000	0.0000	.0000	GAP 10			GAP 10			14.405	.3

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
19	35	-.0094	0.0000	-.0044	.0622	.0489	.0398	81.0	78.5	75.7	10.569	.1
19	36	-.0282	0.0000	-.0131	.0411	.0348	.0299	76.2	73.7	71.1	5.404	-.5
19	37	-.0469	0.0000	-.0219	.0302	.0263	.0232	71.3	68.7	66.0	3.417	-1.8
20	38	-.0756	0.0000	-.0353	.0237	.0191	.0157	66.5	61.5	56.6	1.948	-5.4
21	39	-.1339	0.0000	-.0625	.0167	.0122	.0085	58.8	52.8	47.2	.951	-19.5
22	40	-.2316	0.0000	-.1084	.0094	.0046	.0000	51.4	49.2	74.2	.711	-38.6

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	1.941	-1015.626	.000002	.000985	0.000	0.000	1.799	-1015.627	1000.000	0.0
2	1.941	-1015.626	.000002	.000985	0.000	0.000	1.799	-1015.627	1000.000	-180.0
3					INFINITE	INFINITE	-99.009	9.904	6.139	76.4
6					INFINITE	INFINITE	-99.009	9.904	6.139	-103.6
9					INFINITE	INFINITE	.000	.000	.000	-15.8
10					INFINITE	INFINITE	-.000	-.000	.000	-15.8
4					INFINITE	INFINITE	-600.000	-.000	5.512	-123.4
7					INFINITE	INFINITE	-600.000	-.000	5.512	56.6

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INPUT POWER = 3.763 WATTS
RADIATED POWER = 1.779 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 1.984 WATTS
RADIATION EFFICIENCY = 47.28 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

WIRE NO	INT NO	COORDINATES X WAVELENGTHS	COORDINATES Y WAVELENGTHS	COORDINATES Z WAVELENGTHS	CURRENT DISTRIBUTION AMPLITUDE			CURRENT DISTRIBUTION PHASE DEG			NORMAL ELECTRIC FIELD * RADIUS VOLTS	NORMAL ELECTRIC FIELD * RADIUS DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			164.128	-6.6
1	1	0.0000	0.0000	.0104	.9115	.7415	.5880	81.4	81.0	80.7	149.206	-7.4
1	2	0.0000	0.0000	.0311	.5970	.4516	.3058	80.8	80.6	80.5	134.285	-8.8
1	3	0.0000	0.0000	.0518	.3110	.1603	.0000	80.5	80.4	-103.6	143.424	-9.5
		0.0000	0.0000	0.0000	GAP 2			GAP 2			164.128	-6.6
2	4	0.0000	0.0000	-.0104	.9115	.7415	.5880	81.4	81.0	80.7	149.206	-7.4
2	5	0.0000	0.0000	-.0311	.5970	.4516	.3058	80.8	80.6	80.5	134.285	-8.8
2	6	0.0000	0.0000	-.0518	.3110	.1603	.0000	80.5	80.4	-103.6	143.424	-9.5
		0.0000	0.0000	0.0000	GAP 3			GAP 3			49.787	-169.6
3	7	0.0000	.0090	.0052	.4551	.4111	.3811	-99.2	-101.7	-104.5	38.410	-164.6
3	8	0.0000	.0269	.0156	.3863	.3649	.3473	-104.3	-107.2	-110.4	25.316	-152.5
3	9	0.0000	.0448	.0259	.3484	.3336	.3207	-110.4	-113.7	-117.3	22.619	-148.1
4	10	0.0000	.0722	.0418	.3219	.3007	.2842	-117.2	-125.2	-133.9	21.514	-148.6
5	11	0.0000	.1280	.0739	.2865	.2678	.2664	-133.6	-152.9	-173.0	20.957	-159.1
6	12	0.0000	.2065	.1192	.2671	.2811	.3032	-172.6	167.0	149.5	19.236	178.9
6	13	0.0000	.2885	.1667	.3032	.3233	.3346	149.6	134.9	121.8	15.996	147.0
7	14	0.0000	.3705	.2140	.3348	.3330	.3175	121.9	109.5	96.5	14.740	102.5
7	15	0.0000	.4527	.2614	.3192	.2914	.2611	96.9	81.9	62.5	18.465	61.8
		0.0000	.4937	.2851			GAP 4			GAP 4	20.995	47.9
		0.0000	.4937	.2851	GAP 5			GAP 5			5.265	-47.7
8	16	0.0000	.5348	.3088	.2611	.2245	.1661	62.5	64.1	64.9	9.762	-31.9
8	17	0.0000	.6169	.3561	.1678	.0907	.0000	64.0	64.0	-116.5	17.165	-26.0
		0.0000	0.0000	0.0000	GAP 6			GAP 6			49.787	-169.6
9	18	0.0000	.0090	-.0052	.4551	.4111	.3811	-99.2	-101.7	-104.5	38.410	-164.6
9	19	0.0000	.0269	-.0156	.3863	.3649	.3473	-104.3	-107.2	-110.4	25.316	-152.5
9	20	0.0000	.0448	-.0259	.3484	.3336	.3207	-110.4	-113.7	-117.3	22.619	-148.1
10	21	0.0000	.0722	-.0418	.3219	.3007	.2842	-117.2	-125.2	-133.9	21.514	-148.6
11	22	0.0000	.1280	-.0739	.2865	.2678	.2664	-133.6	-152.9	-173.0	20.957	-159.1
12	23	0.0000	.2065	-.1192	.2671	.2811	.3032	-172.6	167.0	149.5	19.236	178.9
12	24	0.0000	.2885	-.1667	.3032	.3233	.3346	149.6	134.9	121.8	15.996	147.0
13	25	0.0000	.3705	-.2140	.3348	.3330	.3175	121.9	109.5	96.5	14.740	102.5
13	26	0.0000	.4527	-.2614	.3192	.2914	.2611	96.9	81.9	62.5	18.465	61.8
		0.0000	.4937	-.2851			GAP 7			GAP 7	20.995	47.9
		0.0000	.4937	-.2851	GAP 8			GAP 8			5.265	-47.7
14	27	0.0000	.5348	-.3088	.2611	.2245	.1661	62.5	64.1	64.9	9.762	-31.9
14	28	0.0000	.6169	-.3561	.1678	.0907	.0000	64.0	64.0	-116.5	17.165	-26.0
		-.0000	0.0000	-.0000	GAP 9			GAP 9			47.139	147.8
15	29	.0094	0.0000	.0044	.0100	.0474	.0754	-15.9	45.5	48.9	33.095	146.2

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
15	30	.0282	0.0000	.0131	.0701	.0884	.1023	47.9	48.5	48.4	14.881	139.7
15	31	.0469	0.0000	.0219	.1013	.1117	.1199	48.3	47.9	47.4	8.616	132.9
16	32	.0756	0.0000	.0353	.1187	.1290	.1337	47.3	46.1	45.0	3.556	117.8
17	33	.1339	0.0000	.0625	.1312	.1259	.1077	44.7	42.5	40.8	2.779	-28.1
18	34	.2316	0.0000	.1084	.1059	.0595	.0000	40.7	38.6	177.4	8.037	-49.3
		.0000	0.0000	.0000	GAP 10			GAP 10			47.139	147.8
19	35	-.0094	0.0000	-.0044	.0100	.0474	.0754	-15.9	45.5	48.9	33.095	146.2
19	36	-.0282	0.0000	-.0131	.0701	.0884	.1023	47.9	48.5	48.4	14.881	139.7
19	37	-.0469	0.0000	-.0219	.1013	.1117	.1199	48.3	47.9	47.4	8.616	132.9
20	38	-.0756	0.0000	-.0353	.1187	.1290	.1337	47.3	46.1	45.0	3.556	117.8
21	39	-.1339	0.0000	-.0625	.1312	.1259	.1077	44.7	42.5	40.8	2.779	-28.1
22	40	-.2316	0.0000	-.1084	.1059	.0595	.0000	40.7	38.6	177.4	8.037	-49.3

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	167.237	-1083.883	.000139	.000901	0.000	0.000	164.496	-1084.741	1000.000	0.0
2	167.237	-1083.883	.000139	.000901	0.000	0.000	164.496	-1084.741	1000.000	0.0
3					INFINITE	INFINITE	-99.009	9.904	45.287	75.0
6					INFINITE	INFINITE	-99.009	9.904	45.287	75.0
9					INFINITE	INFINITE	-.000	21327.296	214.028	74.2
10					INFINITE	INFINITE	-.000	21327.296	214.028	74.2
4					INFINITE	INFINITE	-600.000	-.000	156.653	62.5
7					INFINITE	INFINITE	-600.000	-.000	156.653	62.5

INPUT POWER = 278.086 WATTS
RADIATED POWER = 27.675 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 250.411 WATTS
RADIATION EFFICIENCY = 9.95 PER CENT

FREQUENCY = 1.1070 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 289

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 32.1 PER CENT FOR GAPS 4 AND 9

EXCITATION MODE

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NET TYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	322000.0000	-0.0000	-0.0000	-0.0000
10	IMP	2- 0	322000.0000	-0.0000	-0.0000	-0.0000
11	IMP	1- 2	-675000.0000	-0.0000	-0.0000	-0.0000

		COORDINATES			CURRENT DISTRIBUTION				NORMAL ELECTRIC FIELD * RADIUS	
		X	Y	Z	AMPLITUDE		PHASE			
IRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			185.783	-.1
1	1	0.0000	0.0000	.0115	1.1096	.8970	.7083	89.9	89.9	89.8	166.361	-.1
1	2	0.0000	0.0000	.0346	.7212	.5446	.3683	89.8	89.8	89.8	146.267	-.1
1	3	0.0000	0.0000	.0576	.3750	.1931	.0000	89.8	89.8	-90.8	155.443	-.2
		0.0000	0.0000	0.0000	GAP 2			GAP 2			185.783	179.9

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
2	4	0.0000	0.0000	-.0115	1.1096	.8970	.7083	-90.1	-90.1	-90.2	166.361	179.9
2	5	0.0000	0.0000	-.0346	.7212	.5446	.3683	-90.2	-90.2	-90.2	146.267	179.9
2	6	0.0000	0.0000	-.0576	.3750	.1931	.0000	-90.2	-90.2	89.2	155.443	179.8
		0.0000	-.0000	-.0000	GAP 3			GAP 3			20.187	176.0
3	7	0.0000	.0100	.0058	.0695	.0485	.0345	-94.6	-94.7	-94.5	14.514	175.3
3	8	0.0000	.0299	.0173	.0369	.0274	.0202	-94.4	-93.5	-91.8	6.950	172.6
3	9	0.0000	.0499	.0289	.0207	.0152	.0110	-91.8	-88.9	-83.9	4.112	169.3
4	10	0.0000	.0803	.0465	.0118	.0067	.0049	-84.3	-65.5	-33.1	1.928	161.9
5	11	0.0000	.1424	.0823	.0060	.0066	.0075	-47.7	-25.7	-28.4	.272	109.4
6	12	0.0000	.2297	.1327	.0080	.0092	.0103	-35.7	-49.5	-65.6	.481	-25.8
6	13	0.0000	.3209	.1854	.0105	.0117	.0125	-66.9	-82.5	-97.4	.585	-65.1
7	14	0.0000	.4122	.2381	.0126	.0130	.0128	-97.7	-112.2	-127.3	.600	-110.8
7	15	0.0000	.5036	.2908	.0130	.0123	.0115	-127.0	-144.2	-165.9	.763	-156.1
		0.0000	.5493	.3172		GAP 4				GAP 4	.881	-172.3
		0.0000	.5493	.3172	GAP 5			GAP 5			.156	47.6
8	16	0.0000	.5950	.3435	.0115	.0104	.0079	-165.9	-163.0	-161.5	.339	94.7
8	17	0.0000	.6863	.3962	.0080	.0044	.0000	-162.8	-162.7	-161.9	.739	107.2
		0.0000	-.0000	.0000	GAP 6			GAP 6			20.187	-4.0
9	18	0.0000	.0100	-.0058	.0695	.0485	.0345	85.4	85.3	85.5	14.514	-4.7
9	19	0.0000	.0299	-.0173	.0369	.0274	.0202	85.6	86.5	88.2	6.950	-7.4
9	20	0.0000	.0499	-.0289	.0207	.0152	.0110	88.2	91.1	96.1	4.112	-10.7
10	21	0.0000	.0803	-.0465	.0118	.0067	.0049	95.7	114.5	146.9	1.928	-18.1
11	22	0.0000	.1424	-.0823	.0060	.0066	.0075	132.3	154.3	151.6	.272	-70.6
12	23	0.0000	.2297	-.1327	.0080	.0092	.0103	144.3	130.5	114.4	.481	154.2
12	24	0.0000	.3209	-.1854	.0105	.0117	.0125	113.1	97.5	82.6	.585	114.9
13	25	0.0000	.4122	-.2381	.0126	.0130	.0128	82.3	67.8	52.7	.600	69.2
13	26	0.0000	.5036	-.2908	.0130	.0123	.0115	53.0	35.8	14.1	.763	23.9
		0.0000	.5493	-.3172		GAP 7				GAP 7	.881	7.7
		0.0000	.5493	-.3172	GAP 8			GAP 8			.156	-132.4
14	27	0.0000	.5950	-.3435	.0115	.0104	.0079	14.1	17.0	18.5	.339	-85.3
14	28	0.0000	.6863	-.3962	.0080	.0044	.0000	17.2	17.3	18.1	.739	-72.8
		0.0000	0.0000	0.0000	GAP 9			GAP 9			14.432	-179.7
15	29	.0104	0.0000	.0049	.0689	.0540	.0439	-98.4	-100.8	-103.4	10.589	-179.8
15	30	.0313	0.0000	.0146	.0454	.0383	.0328	-102.9	-105.3	-107.8	5.400	179.5
15	31	.0522	0.0000	.0244	.0332	.0289	.0254	-107.6	-110.1	-112.7	3.400	178.3
16	32	.0841	0.0000	.0393	.0259	.0208	.0171	-112.2	-116.9	-121.4	1.922	174.6
17	33	.1490	0.0000	.0696	.0182	.0134	.0093	-119.2	-124.4	-129.1	.932	160.7
18	34	.2576	0.0000	.1206	.0104	.0051	.0000	-124.9	-125.6	-111.7	.711	145.1
		0.0000	0.0000	0.0000	GAP 10			GAP 10			14.432	.3
19	35	-.0104	0.0000	-.0049	.0689	.0540	.0439	81.6	79.2	76.6	10.589	.2
19	36	-.0313	0.0000	-.0146	.0454	.0383	.0328	77.1	74.7	72.2	5.400	-.5
19	37	-.0522	0.0000	-.0244	.0332	.0289	.0254	72.4	69.9	67.3	3.400	-1.7
20	38	-.0841	0.0000	-.0393	.0259	.0208	.0171	67.8	63.1	58.6	1.922	-5.4
21	39	-.1490	0.0000	-.0696	.0182	.0134	.0093	60.8	55.6	50.9	.932	-19.3
22	40	-.2576	0.0000	-.1206	.0104	.0051	.0000	55.1	54.4	68.3	.711	-34.9

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	2.199	-901.193	.000003	.001110	0.000	0.000	2.083	-901.193	1000.000	0.0
2	2.199	-901.193	.000003	.001110	0.000	0.000	2.083	-901.193	1000.000	-180.0
3					INFINITE	INFINITE	-98.777	10.993	6.906	79.0
6					INFINITE	INFINITE	-98.777	10.993	6.906	-101.0
9					INFINITE	INFINITE	-.000	.000	.000	-5.8
10					INFINITE	INFINITE	.000	-.000	.000	-5.8
4					INFINITE	INFINITE	-600.000	-.000	6.906	-165.9
7					INFINITE	INFINITE	-600.000	.000	6.906	14.1

INPUT POWER = 5.415 WATTS
RADIATED POWER = 2.904 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 2.511 WATTS
RADIATION EFFICIENCY = 53.63 PER CENT

EXCITATION MODE 2

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

COORDINATES CURRENT DISTRIBUTION NORMAL ELECTRIC FIELD * RADIUS

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			166.239	-7.8
1	1	0.0000	0.0000	.0115	1.0421	.8501	.6755	80.0	79.6	79.3	152.030	-8.7
1	2	0.0000	0.0000	.0346	.6857	.5194	.3521	79.4	79.2	79.0	138.272	-10.2
1	3	0.0000	0.0000	.0576	.3581	.1847	.0000	79.1	78.9	-106.3	148.463	-10.9
		0.0000	0.0000	0.0000	GAP 2			GAP 2			166.239	-7.8
2	4	0.0000	0.0000	-.0115	1.0421	.8501	.6755	80.0	79.6	79.3	152.030	-8.7
2	5	0.0000	0.0000	-.0346	.6857	.5194	.3521	79.4	79.2	79.0	138.272	-10.2
2	6	0.0000	0.0000	-.0576	.3581	.1847	.0000	79.1	78.9	-106.3	148.463	-10.9
		0.0000	-.0000	-.0000	GAP 3			GAP 3			48.156	-166.2
3	7	0.0000	.0100	.0058	.5216	.4762	.4459	-100.8	-103.6	-106.6	37.475	-160.5
3	8	0.0000	.0299	.0173	.4516	.4307	.4137	-106.5	-109.6	-112.9	25.560	-147.6
3	9	0.0000	.0499	.0289	.4149	.4007	.3884	-112.9	-116.3	-120.0	23.385	-144.5
4	10	0.0000	.0803	.0465	.3897	.3689	.3517	-119.9	-127.8	-136.2	22.656	-147.7
5	11	0.0000	.1424	.0823	.3544	.3302	.3190	-135.9	-154.4	-174.5	22.676	-163.8
6	12	0.0000	.2297	.1327	.3197	.3225	.3370	-174.1	163.9	143.5	21.945	168.6
6	13	0.0000	.3209	.1854	.3369	.3540	.3654	143.6	125.5	109.1	19.403	133.8
7	14	0.0000	.4122	.2381	.3658	.3654	.3519	109.2	93.6	77.6	18.035	89.5
7	15	0.0000	.5036	.2908	.3544	.3289	.3036	78.1	60.0	37.8	21.354	46.0
		0.0000	.5493	.3172			GAP 4			GAP 4	23.816	29.7
		0.0000	.5493	.3172	GAP 5			GAP 5			3.667	-89.1
8	16	0.0000	.5950	.3435	.3036	.2699	.2040	37.8	39.6	40.5	9.247	-57.8
8	17	0.0000	.6863	.3962	.2063	.1129	.0000	39.5	39.4	38.8	19.027	-50.5
		0.0000	-.0000	.0000	GAP 6			GAP 6			48.156	-166.2
9	18	0.0000	.0100	-.0058	.5216	.4762	.4459	-100.8	-103.6	-106.6	37.475	-160.5
9	19	0.0000	.0299	-.0173	.4516	.4307	.4137	-106.5	-109.6	-112.9	25.560	-147.6
9	20	0.0000	.0499	-.0289	.4149	.4007	.3884	-112.9	-116.3	-120.0	23.385	-144.5
10	21	0.0000	.0803	-.0465	.3897	.3689	.3517	-119.9	-127.8	-136.2	22.656	-147.7
11	22	0.0000	.1424	-.0823	.3544	.3302	.3190	-135.9	-154.4	-174.5	22.676	-163.8
12	23	0.0000	.2297	-.1327	.3197	.3225	.3370	-174.1	163.9	143.5	21.945	168.6
12	24	0.0000	.3209	-.1854	.3369	.3540	.3654	143.6	125.5	109.1	19.403	133.8
13	25	0.0000	.4122	-.2381	.3658	.3654	.3519	109.2	93.6	77.6	18.035	89.5
13	26	0.0000	.5036	-.2908	.3544	.3289	.3036	78.1	60.0	37.8	21.354	46.0
		0.0000	.5493	-.3172			GAP 7			GAP 7	23.816	29.7
		0.0000	.5493	-.3172	GAP 8			GAP 8			3.667	-89.1
14	27	0.0000	.5950	-.3435	.3036	.2699	.2040	37.8	39.6	40.5	9.247	-57.8
14	28	0.0000	.6863	-.3962	.2063	.1129	.0000	39.5	39.4	38.8	19.027	-50.5
		0.0000	0.0000	0.0000	GAP 9			GAP 9			55.680	144.2
15	29	.0104	0.0000	.0049	.0136	.0657	.1042	-5.8	43.2	46.1	39.999	142.4
15	30	.0313	0.0000	.0146	.0975	.1239	.1447	45.2	45.7	45.5	19.555	136.3
15	31	.0522	0.0000	.0244	.1434	.1597	.1729	45.4	45.0	44.6	12.294	130.7
16	32	.0841	0.0000	.0393	.1715	.1899	.2000	44.4	43.4	42.5	5.919	120.7
17	33	.1490	0.0000	.0696	.1970	.1945	.1699	42.2	40.4	39.1	2.912	-28.9
18	34	.2576	0.0000	.1206	.1681	.0966	.0000	39.0	37.4	-158.2	11.540	-51.0
		0.0000	0.0000	0.0000	GAP 10			GAP 10			55.680	144.2
19	35	-.0104	0.0000	-.0049	.0136	.0657	.1042	-5.8	43.2	46.1	39.999	142.4
19	36	-.0313	0.0000	-.0146	.0975	.1239	.1447	45.2	45.7	45.5	19.555	136.3
19	37	-.0522	0.0000	-.0244	.1434	.1597	.1729	45.4	45.0	44.6	12.294	130.7

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE X AMP	AMPLITUDE Y AMP	AMPLITUDE Z AMP	PHASE X DEG	PHASE Y DEG	PHASE Z DEG	VOLTS	VOLTS DEG
20	38	-.0841	0.0000	-.0393	.1715	.1899	.2000	44.4	43.4	42.5	5.919	120.7
21	39	-.1490	0.0000	-.0696	.1970	.1945	.1699	42.2	40.4	39.1	2.912	-28.9
22	40	-.2576	0.0000	-.1206	.1681	.0966	.0000	39.0	37.4	-158.2	11.540	-51.0

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	169.531	-943.954	.000184	.001026	0.000	0.000	166.849	-944.941	1000.000	0.0
2	169.531	-943.954	.000184	.001026	0.000	0.000	166.849	-944.941	1000.000	0.0
3					INFINITE	INFINITE	-98.777	10.993	51.841	72.9
6					INFINITE	INFINITE	-98.777	10.993	51.841	72.9
9					INFINITE	INFINITE	.000	19169.520	260.154	84.2
10					INFINITE	INFINITE	.000	19169.520	260.154	84.2
4					INFINITE	INFINITE	-600.000	-.000	182.146	37.8
7					INFINITE	INFINITE	-600.000	-.000	182.146	37.8

INPUT POWER =	368.630 WATTS
RADIATED POWER =	33.736 WATTS
WIRE LOSS =	.000 WATTS
NETWORK LOSS =	334.893 WATTS
RADIATION EFFICIENCY =	9.15 PER CENT

WIRE COORDINATES IN FEET AND WIRE RADII IN INCHES

WIRE NO		X1	Y1	Z1	RAD1		X2	Y2	Z2	RAD2	INTERVALS
1	GAP 1	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	61.5000	.250000	3
2	GAP 2	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	-61.5000	.250000	3
3	GAP 3	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	30.8000	.250000	3
4		-0.0000	53.2000	30.8000	.250000		-0.0000	89.6000	51.8000	.250000	1
5		-0.0000	89.6000	51.8000	.250000		-0.0000	163.7000	94.5000	.250000	1
6		-0.0000	163.7000	94.5000	.250000		-0.0000	325.9000	188.3000	.250000	2
7		-0.0000	325.9000	188.3000	.250000	GAP 4	-0.0000	488.4000	282.0000	.250000	2
8	GAP 5	-0.0000	488.4000	282.0000	.250000		-0.0000	650.8000	375.7000	.250000	2
9	GAP 6	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	-30.8000	.250000	3
10		-0.0000	53.2000	-30.8000	.250000		-0.0000	89.6000	-51.8000	.250000	1
11		-0.0000	89.6000	-51.8000	.250000		-0.0000	163.7000	-94.5000	.250000	1
12		-0.0000	163.7000	-94.5000	.250000		-0.0000	325.9000	-188.3000	.250000	2
13		-0.0000	325.9000	-188.3000	.250000	GAP 7	-0.0000	488.4000	-282.0000	.250000	2
14	GAP 8	-0.0000	488.4000	-282.0000	.250000		-0.0000	650.8000	-375.7000	.250000	2
15	GAP 9	-0.0000	-0.0000	-0.0000	.290000		55.7000	-0.0000	26.0000	.290000	3
16		55.7000	-0.0000	26.0000	.290000		93.8000	-0.0000	43.8000	.290000	1

WIRE NO		X1	Y1	Z1	RAD1	X2	Y2	Z2	RAD2	INTERVALS
17		93.8000	-0.0000	43.8000	.290000	171.2000	-0.0000	79.9000	.290000	1
18		171.2000	-0.0000	79.9000	.290000	286.9000	-0.0000	134.6000	.290000	2
19	GAP 10	-0.0000	-0.0000	-0.0000	.290000	-55.7000	-0.0000	-26.0000	.290000	3
20		-55.7000	-0.0000	-26.0000	.290000	-93.8000	-0.0000	-43.8000	.290000	1
21		-93.8000	-0.0000	-43.8000	.290000	-171.2000	-0.0000	-79.9000	.290000	1
22		-171.2000	-0.0000	-79.9000	.290000	-286.9000	-0.0000	-134.6000	.290000	2

FREQUENCY = 1.3100 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 290

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 47.6 PER CENT FOR GAPS 4 AND 9

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	229000.0000	-0.0000	-0.0000	-0.0000

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
10	IMP	2- 0	229000.0000	-0.0000	-0.0000	-0.0000
11	IMP	1- 2	-486000.0000	-0.0000	-0.0000	-0.0000

		COORDINATES			CURRENT DISTRIBUTION						NORMAL ELECTRIC FIELD * RADIUS	
		X	Y	Z	AMPLITUDE			PHASE				
WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			185.842	-.1
1	1	0.0000	0.0000	.0136	1.3499	1.0969	.8699	89.8	89.8	89.7	168.220	-.1
1	2	0.0000	0.0000	.0409	.8852	.6706	.4546	89.8	89.7	89.7	150.909	-.2
1	3	0.0000	0.0000	.0682	.4628	.2387	.0000	89.7	89.7	89.1	162.168	-.3
		0.0000	0.0000	0.0000	GAP 2			GAP 2			185.842	179.9
2	4	0.0000	0.0000	-.0136	1.3499	1.0969	.8699	-90.2	-90.2	-90.3	168.220	179.9
2	5	0.0000	0.0000	-.0409	.8852	.6706	.4546	-90.2	-90.3	-90.3	150.909	179.8
2	6	0.0000	0.0000	-.0682	.4628	.2387	.0000	-90.3	-90.3	-90.9	162.168	179.7
		0.0000	0.0000	0.0000	GAP 3			GAP 3			20.258	175.1
3	7	0.0000	.0118	.0068	.0852	.0604	.0439	-93.0	-92.1	-90.4	14.523	174.3
3	8	0.0000	.0354	.0205	.0468	.0358	.0276	-90.6	-88.3	-85.0	6.832	171.4
3	9	0.0000	.0590	.0342	.0283	.0223	.0179	-85.1	-80.7	-74.8	3.916	168.2
4	10	0.0000	.0950	.0550	.0188	.0138	.0118	-75.7	-62.5	-49.9	1.654	162.4
5	11	0.0000	.1686	.0974	.0135	.0135	.0139	-56.5	-53.3	-62.3	.122	-43.8
6	12	0.0000	.2718	.1570	.0152	.0163	.0171	-65.6	-81.2	-98.7	.738	-70.7
6	13	0.0000	.3798	.2194	.0176	.0182	.0182	-99.2	-117.0	-135.6	.880	-114.3
7	14	0.0000	.4878	.2818	.0185	.0180	.0173	-135.7	-155.2	-176.9	.992	-161.3
7	15	0.0000	.5960	.3442	.0176	.0168	.0167	-176.3	159.4	131.8	1.180	154.7
		0.0000	.6500	.3753			GAP 4			GAP 4	1.271	136.0
		0.0000	.6500	.3753	GAP 5			GAP 5			.202	-78.7
8	16	0.0000	.7041	.4065	.0167	.0160	.0127	131.8	134.7	136.1	.324	28.4
8	17	0.0000	.8122	.4689	.0129	.0073	.0000	134.7	134.7	134.7	1.014	44.7
		0.0000	0.0000	0.0000	GAP 6			GAP 6			20.258	-4.9
9	18	0.0000	.0118	-.0068	.0852	.0604	.0439	87.0	87.9	89.6	14.523	-5.7
9	19	0.0000	.0354	-.0205	.0468	.0358	.0276	89.4	91.7	95.0	6.832	-8.6
9	20	0.0000	.0590	-.0342	.0283	.0223	.0179	94.9	99.3	105.2	3.916	-11.8
10	21	0.0000	.0950	-.0550	.0188	.0138	.0118	104.3	117.5	130.1	1.654	-17.6
11	22	0.0000	.1686	-.0974	.0135	.0135	.0139	123.5	126.7	117.7	.122	136.2
12	23	0.0000	.2718	-.1570	.0152	.0163	.0171	114.4	98.8	81.3	.738	109.3
12	24	0.0000	.3798	-.2194	.0176	.0182	.0182	80.8	63.0	44.4	.880	65.7
13	25	0.0000	.4878	-.2818	.0185	.0180	.0173	44.3	24.8	3.1	.992	18.7
13	26	0.0000	.5960	-.3442	.0176	.0168	.0167	3.7	-20.6	-48.2	1.180	-25.3
		0.0000	.6500	-.3753			GAP 7			GAP 7	1.271	-44.0
		0.0000	.6500	-.3753	GAP 8			GAP 8			.202	-101.3
14	27	0.0000	.7041	-.4065	.0167	.0160	.0127	-48.2	-45.3	-43.9	.324	-151.6
14	28	0.0000	.8122	-.4689	.0129	.0073	.0000	-45.3	-45.3	-45.3	1.014	-135.3
		0.0000	0.0000	0.0000	GAP 9			GAP 9			14.499	-179.6
15	29	.0124	0.0000	.0058	.0798	.0621	.0500	-98.5	-101.0	-103.7	10.624	-179.8
15	30	.0371	0.0000	.0173	.0519	.0435	.0371	-103.2	-105.7	-108.4	5.358	179.4
15	31	.0618	0.0000	.0288	.0376	.0326	.0286	-108.1	-110.7	-113.4	3.308	178.0

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
16	32	.0995	0.0000	.0465	.0293	.0236	.0195	-112.8	-117.4	-121.6	1.787	173.8
17	33	.1764	0.0000	.0823	.0210	.0160	.0118	-119.2	-122.4	-123.6	.801	156.5
18	34	.2664	0.0000	.1245	.0124	.0094	.0063	-121.9	-121.4	-120.6	.699	146.7
18	35	.3434	0.0000	.1609	.0065	.0033	.0000	-120.0	-118.7	100.7	.742	150.0
		0.0000	0.0000	0.0000	GAP 10			GAP 10			14.499	.4
19	36	-.0124	0.0000	-.0058	.0798	.0621	.0500	81.5	79.0	76.3	10.624	.2
19	37	-.0371	0.0000	-.0173	.0519	.0435	.0371	76.8	74.3	71.6	5.358	-.6
19	38	-.0618	0.0000	-.0288	.0376	.0326	.0286	71.9	69.3	66.6	3.308	-2.0
20	39	-.0995	0.0000	-.0465	.0293	.0236	.0195	67.2	62.6	58.4	1.787	-6.2
21	40	-.1764	0.0000	-.0823	.0210	.0160	.0118	60.8	57.6	56.4	.801	-23.5
22	41	-.2664	0.0000	-.1245	.0124	.0094	.0063	58.1	58.6	59.4	.699	-33.3
22	42	-.3434	0.0000	-.1609	.0065	.0033	.0000	60.0	61.3	-79.3	.742	-30.0

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	DEGREES
1	2.748	-740.778	.000005	.001350	0.000	0.000	2.610	-740.779	1000.000	0.0
2	2.748	-740.778	.000005	.001350	0.000	0.000	2.610	-740.779	1000.000	-180.0
3					INFINITE	INFINITE	-98.295	12.945	8.450	79.5
6					INFINITE	INFINITE	-98.295	12.945	8.450	-100.5
9					INFINITE	INFINITE	-.000	.000	.000	-8.4
10					INFINITE	INFINITE	.000	-.000	.000	-8.4
4					INFINITE	INFINITE	-600.000	-.000	10.028	131.8
7					INFINITE	INFINITE	-600.000	0.000	10.028	-48.2

INPUT POWER =	10.015 WATTS
RADIATED POWER =	5.985 WATTS
WIRE LOSS =	.000 WATTS
NETWORK LOSS =	4.030 WATTS
RADIATION EFFICIENCY =	59.76 PER CENT

EXCITATION MODE 2.

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

WIRE NO	INT NO	COORDINATES X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	CURRENT DISTRIBUTION AMPLITUDE	AMP	AMP	PHASE DEG	DEG	DEG	NORMAL ELECTRIC FIELD & RADIUS VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			164.367	-11.9
1	1	0.0000	0.0000	.0136	1.2343	1.0090	.8033	76.0	75.7	75.4	151.092	-12.8
1	2	0.0000	0.0000	.0409	.8156	.6188	.4199	75.5	75.3	75.2	138.694	-14.2
1	3	0.0000	0.0000	.0682	.4271	.2203	.0000	75.2	75.1	72.0	149.657	-14.8
		0.0000	0.0000	0.0000	GAP 2			GAP 2			164.367	-11.9
2	4	0.0000	0.0000	-.0136	1.2343	1.0090	.8033	76.0	75.7	75.4	151.092	-12.8
2	5	0.0000	0.0000	-.0409	.8156	.6188	.4199	75.5	75.3	75.2	138.694	-14.2
2	6	0.0000	0.0000	-.0682	.4271	.2203	.0000	75.2	75.1	72.0	149.657	-14.8
		0.0000	0.0000	0.0000	GAP 3			GAP 3			53.270	-157.0
3	7	0.0000	.0118	.0068	.6187	.5677	.5341	-105.3	-109.8	-114.4	43.711	-152.4
3	8	0.0000	.0354	.0205	.5401	.5170	.4986	-114.1	-118.7	-123.4	32.783	-145.0
3	9	0.0000	.0590	.0342	.4998	.4848	.4722	-123.3	-128.1	-133.1	30.642	-146.5
4	10	0.0000	.0950	.0550	.4735	.4538	.4395	-133.0	-143.4	-154.3	29.548	-154.8
5	11	0.0000	.1686	.0974	.4417	.4270	.4278	-153.9	-176.4	161.0	28.587	-178.7
6	12	0.0000	.2718	.1570	.4274	.4393	.4540	161.4	137.8	116.1	26.732	142.9
6	13	0.0000	.3798	.2194	.4534	.4609	.4561	116.1	95.7	75.6	24.740	96.3
7	14	0.0000	.4878	.2818	.4565	.4392	.4158	75.6	54.8	32.2	25.480	47.2
7	15	0.0000	.5960	.3442	.4206	.3979	.3941	32.6	7.4	-21.0	28.907	2.1
		0.0000	.6500	.3753		GAP 4				GAP 4	30.623	-17.3
		0.0000	.6500	.3753	GAP 5			GAP 5			3.997	117.9
8	16	0.0000	.7041	.4065	.3941	.3786	.3003	-21.0	-18.9	-18.0	7.503	-120.4
8	17	0.0000	.8122	.4689	.3036	.1707	.0000	-19.2	-19.4	-19.7	23.840	-109.2
		0.0000	0.0000	0.0000	GAP 6			GAP 6			53.270	-157.0
9	18	0.0000	.0118	-.0068	.6187	.5677	.5341	-105.3	-109.8	-114.4	43.711	-152.4
9	19	0.0000	.0354	-.0205	.5401	.5170	.4986	-114.1	-118.7	-123.4	32.783	-145.0
9	20	0.0000	.0590	-.0342	.4998	.4848	.4722	-123.3	-128.1	-133.1	30.642	-146.5
10	21	0.0000	.0950	-.0550	.4735	.4538	.4395	-133.0	-143.4	-154.3	29.548	-154.8
11	22	0.0000	.1686	-.0974	.4417	.4270	.4278	-153.9	-176.4	161.0	28.587	-178.7
12	23	0.0000	.2718	-.1570	.4274	.4393	.4540	161.4	137.8	116.1	26.732	142.9
12	24	0.0000	.3798	-.2194	.4534	.4609	.4561	116.1	95.7	75.6	24.740	96.3

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
13	25	0.0000	.4878	-.2818	.4565	.4392	.4158	75.6	54.8	32.2	25.480	47.2
13	26	0.0000	.5960	-.3442	.4206	.3979	.3941	32.6	7.4	-21.0	28.907	2.1
		0.0000	.6500	-.3753			GAP 7			GAP 7	30.623	-17.3
		0.0000	.6500	-.3753	GAP 8			GAP 8			3.997	117.9
14	27	0.0000	.7041	-.4065	.3941	.3786	.3003	-21.0	-18.9	-18.0	7.503	-120.4
14	28	0.0000	.8122	-.4689	.3036	.1707	.0000	-19.2	-19.4	-19.7	23.840	-109.2
		0.0000	0.0000	0.0000	GAP 9			GAP 9			74.743	122.9
15	29	.0124	0.0000	.0058	.0283	.1175	.1868	-8.4	22.7	24.5	57.435	119.9
15	30	.0371	0.0000	.0173	.1781	.2315	.2772	23.6	23.6	23.0	34.758	112.0
15	31	.0618	0.0000	.0288	.2756	.3150	.3494	22.9	22.2	21.6	25.989	106.8
16	32	.0995	0.0000	.0465	.3478	.4034	.4418	21.5	20.1	19.0	16.367	100.2
17	33	.1764	0.0000	.0823	.4383	.4626	.4225	18.8	16.9	15.5	2.508	-15.6
18	34	.2664	0.0000	.1245	.4217	.3527	.2562	15.5	14.6	13.9	18.809	-72.1
18	35	.3434	0.0000	.1609	.2592	.1388	.0000	13.9	13.3	-174.4	29.409	-76.1
		0.0000	0.0000	0.0000	GAP 10			GAP 10			74.743	122.9
19	36	-.0124	0.0000	-.0058	.0283	.1175	.1868	-8.4	22.7	24.5	57.435	119.9
19	37	-.0371	0.0000	-.0173	.1781	.2315	.2772	23.6	23.6	23.0	34.758	112.0
19	38	-.0618	0.0000	-.0288	.2756	.3150	.3494	22.9	22.2	21.6	25.989	106.8
20	39	-.0995	0.0000	-.0465	.3478	.4034	.4418	21.5	20.1	19.0	16.367	100.2
21	40	-.1764	0.0000	-.0823	.4383	.4626	.4225	18.8	16.9	15.5	2.508	-15.6
22	41	-.2664	0.0000	-.1245	.4217	.3527	.2562	15.5	14.6	13.9	18.809	-72.1
22	42	-.3434	0.0000	-.1609	.2592	.1388	.0000	13.9	13.3	-174.4	29.409	-76.1

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	198.256	-784.792	.000303	.001198	0.000	0.000	195.732	-786.143	1000.000	0.0
2	198.256	-784.792	.000303	.001198	0.000	0.000	195.732	-786.143	1000.000	0.0
3					INFINITE	INFINITE	-98.295	12.945	61.340	67.2
6					INFINITE	INFINITE	-98.295	12.945	61.340	67.2
9					INFINITE	INFINITE	-.000	16198.976	457.996	81.6
10					INFINITE	INFINITE	-.000	16198.976	457.996	81.6
4					INFINITE	INFINITE	-600.000	-.000	236.462	-21.0
7					INFINITE	INFINITE	-600.000	-.000	236.462	-21.0

INPUT POWER = 605.174 WATTS
RADIATED POWER = 73.175 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 531.999 WATTS
RADIATION EFFICIENCY = 12.09 PER CENT

FREQUENCY = 1.6500 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 291

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 8.2 PER CENT FOR GAPS 3 AND

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

ET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	1150000.0000	-0.0000	-0.0000	-0.0000
10	IMP	2- 0	1150000.0000	-0.0000	-0.0000	-0.0000
11	IMP	1- 2	-1150000.0000	-0.0000	-0.0000	-0.0000

WIRE NO	INT NO	COORDINATES X WAVELENGTHS	COORDINATES Y WAVELENGTHS	COORDINATES Z WAVELENGTHS	CURRENT DISTRIBUTION AMPLITUDE AMP	AMP	AMP	CURRENT DISTRIBUTION PHASE DEG	DEG	DEG	NORMAL ELECTRIC FIELD * RADIUS VOLTS	DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1			185.989	-.1
1	1	0.0000	0.0000	.0172	1.8067	1.4839	1.1872	89.6	89.5	89.5	172.457	-.2
1	2	0.0000	0.0000	.0515	1.2071	.9202	.6268	89.5	89.4	89.4	161.557	-.4
1	3	0.0000	0.0000	.0859	.6380	.3300	.0000	89.4	89.3	-91.9	177.621	-.6
		0.0000	0.0000	.0000	GAP 2			GAP 2			185.989	179.9
2	4	0.0000	0.0000	-.0172	1.8067	1.4839	1.1872	-90.4	-90.5	-90.5	172.457	179.8
2	5	0.0000	0.0000	-.0515	1.2071	.9202	.6268	-90.5	-90.6	-90.6	161.557	179.6
2	6	0.0000	0.0000	-.0859	.6380	.3300	.0000	-90.6	-90.7	88.1	177.621	179.4
		0.0000	0.0000	0.0000	GAP 3			GAP 3			20.594	172.7
3	7	0.0000	.0149	.0086	.1260	.0949	.0747	-87.0	-83.4	-79.2	14.750	172.0
3	8	0.0000	.0446	.0258	.0784	.0654	.0559	-79.9	-75.7	-71.3	6.852	170.3
3	9	0.0000	.0743	.0430	.0567	.0499	.0448	-71.7	-67.5	-63.6	3.862	171.5
4	10	0.0000	.1197	.0692	.0460	.0394	.0344	-64.5	-59.6	-58.2	1.697	-172.1
5	11	0.0000	.2123	.1226	.0372	.0304	.0248	-61.3	-72.4	-99.1	1.605	-110.5
6	12	0.0000	.3424	.1977	.0274	.0284	.0345	-99.5	-135.9	-165.3	2.164	-122.3
6	13	0.0000	.4784	.2764	.0353	.0406	.0414	-164.4	175.4	158.1	1.603	-169.9
7	14	0.0000	.6144	.3549	.0417	.0371	.0296	158.4	139.4	112.1	1.908	113.6
7	15	0.0000	.7507	.4335	.0304	.0258	.0300	112.4	71.5	28.4	2.557	70.0
		0.0000	.8188	.4727			GAP 4			GAP 4	2.483	51.1
		0.0000	.8188	.4727	GAP 5			GAP 5			1.012	133.1
8	16	0.0000	.8868	.5120	.0300	.0340	.0296	28.4	31.0	31.7	.112	-136.9
8	17	0.0000	1.0229	.5906	.0301	.0178	.0000	30.4	30.0	29.1	1.904	-59.6
		0.0000	0.0000	0.0000	GAP 6			GAP 6			20.594	-7.3
9	18	0.0000	.0149	-.0086	.1260	.0949	.0747	93.0	96.6	100.8	14.750	-8.0
9	19	0.0000	.0446	-.0258	.0784	.0654	.0559	100.1	104.3	108.7	6.852	-9.7
9	20	0.0000	.0743	-.0430	.0567	.0499	.0448	108.3	112.5	116.4	3.862	-8.5
10	21	0.0000	.1197	-.0692	.0460	.0394	.0344	115.5	120.4	121.8	1.697	7.9
11	22	0.0000	.2123	-.1226	.0372	.0304	.0248	118.7	107.6	80.9	1.605	69.5
12	23	0.0000	.3424	-.1977	.0274	.0284	.0345	80.5	44.1	14.7	2.164	57.7
12	24	0.0000	.4784	-.2764	.0353	.0406	.0414	15.6	-4.6	-21.9	1.603	10.1
13	25	0.0000	.6144	-.3549	.0417	.0371	.0296	-21.6	-40.6	-67.9	1.908	-66.4
13	26	0.0000	.7507	-.4335	.0304	.0258	.0300	-67.6	-108.5	-151.6	2.557	-110.0
		0.0000	.8188	-.4727			GAP 7			GAP 7	2.483	-128.9
		0.0000	.8188	-.4727	GAP 8			GAP 8			1.012	-46.9
14	27	0.0000	.8868	-.5120	.0300	.0340	.0296	-151.6	-149.0	-148.3	.112	43.1
14	28	0.0000	1.0229	-.5906	.0301	.0178	.0000	-149.6	-150.0	-150.9	1.904	120.4
		0.0000	0.0000	0.0000	GAP 9			GAP 9			14.640	-179.5
15	29	.0156	0.0000	.0073	.0957	.0735	.0585	-100.3	-103.5	-107.1	10.657	-179.7
15	30	.0467	0.0000	.0218	.0609	.0509	.0434	-106.4	-109.6	-113.0	5.158	179.3
15	31	.0778	0.0000	.0363	.0440	.0384	.0342	-112.6	-115.8	-118.7	2.949	177.3
16	32	.1253	0.0000	.0585	.0351	.0297	.0262	-117.9	-122.0	-124.4	1.310	170.0
17	33	.2221	0.0000	.1037	.0284	.0251	.0213	-121.5	-119.7	-116.3	.516	133.4
18	34	.3355	0.0000	.1569	.0226	.0187	.0135	-115.4	-112.7	-110.3	.833	147.1
18	35	.4325	0.0000	.2027	.0141	.0076	.0000	-110.4	-108.5	-100.6	1.276	159.6

WIRE NO	INT NO	X WAVELENGTHS	Y WAVELENGTHS	Z WAVELENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
		.0.0000	0.0000	0.0000	GAP 10			GAP 10			14.640	.5
19	36	-.0156	0.0000	-.0073	.0957	.0735	.0585	79.7	76.5	72.9	10.657	.3
19	37	-.0467	0.0000	-.0218	.0609	.0509	.0434	73.6	70.4	67.0	5.158	-.7
19	38	-.0778	0.0000	-.0363	.0440	.0384	.0342	67.4	64.2	61.3	2.949	-2.7
20	39	-.1253	0.0000	-.0585	.0351	.0297	.0262	62.1	58.0	55.6	1.310	-10.0
21	40	-.2221	0.0000	-.1037	.0284	.0251	.0213	58.5	60.3	63.7	.516	-46.6
22	41	-.3355	0.0000	-.1569	.0226	.0187	.0135	64.6	67.3	69.7	.833	-32.9
22	42	-.4325	0.0000	-.2027	.0141	.0076	.0000	69.6	71.5	79.4	1.276	-20.4

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	DEGREES
1	4.098	-553.490	.000013	.001807	0.000	0.000	3.931	-553.493	1000.000	0.0
2	4.098	-553.490	.000013	.001807	0.000	0.000	3.931	-553.493	1000.000	-180.0
3					INFINITE	INFINITE	-97.322	16.143	12.432	83.6
6					INFINITE	INFINITE	-97.322	16.143	12.432	-96.4
9					INFINITE	INFINITE	.000	.000	.000	-70.4
10					INFINITE	INFINITE	-.000	-.000	.000	-70.4
4					INFINITE	INFINITE	-600.000	-.000	18.005	28.4
7					INFINITE	INFINITE	-600.000	-.000	18.005	-151.6

INPUT POWER = 26.753 WATTS
RADIATED POWER = 17.321 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 9.432 WATTS
RADIATION EFFICIENCY = 64.74 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

WIRE NO	INT NO	COORDINATES X WAVE-LENGTHS	COORDINATES Y WAVE-LENGTHS	COORDINATES Z WAVE-LENGTHS	CURRENT DISTRIBUTION AMPLITUDE			CURRENT DISTRIBUTION PHASE			NORMAL ELECTRIC FIELD * RADIUS	
					AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1			153.971	-7.9
1	1	0.0000	0.0000	.0172	1.7377	1.4621	1.1900	77.7	77.1	76.6	152.663	-9.9
1	2	0.0000	0.0000	.0515	1.2013	.9243	.6345	76.7	76.5	76.2	157.827	-12.7
1	3	0.0000	0.0000	.0859	.6443	.3350	.0000	76.3	76.1	-108.3	179.384	-13.7
		0.0000	0.0000	.0000	GAP 2			GAP 2			153.971	-7.9
2	4	0.0000	0.0000	-.0172	1.7377	1.4621	1.1900	77.7	77.1	76.6	152.663	-9.9
2	5	0.0000	0.0000	-.0515	1.2013	.9243	.6345	76.7	76.5	76.2	157.827	-12.7
2	6	0.0000	0.0000	-.0859	.6443	.3350	.0000	76.3	76.1	-108.3	179.384	-13.7
		0.0000	0.0000	0.0000	GAP 3			GAP 3			55.528	-175.7
3	7	0.0000	.0149	.0086	.8573	.7770	.7277	-102.8	-105.0	-107.7	40.680	-167.7
3	8	0.0000	.0446	.0258	.7410	.7103	.6855	-107.6	-110.5	-113.5	25.662	-147.6
3	9	0.0000	.0743	.0430	.6883	.6669	.6464	-113.5	-116.7	-120.1	24.307	-145.4
4	10	0.0000	.1197	.0692	.6497	.6086	.5624	-120.0	-127.3	-135.5	25.341	-155.6
5	11	0.0000	.2123	.1226	.5704	.4674	.3781	-135.1	-155.4	174.6	30.263	176.4
6	12	0.0000	.3424	.1977	.3807	.3628	.4324	176.0	134.7	100.8	31.520	143.1
6	13	0.0000	.4784	.2764	.4287	.4972	.5098	101.3	78.3	60.1	21.470	93.6
7	14	0.0000	.6144	.3549	.5079	.4512	.3549	60.2	40.9	14.1	23.164	14.5
7	15	0.0000	.7507	.4335	.3598	.2956	.3398	14.1	-27.7	-72.8	30.458	-31.1
		0.0000	.8188	.4727			GAP 4			GAP 4	29.309	-50.7
		0.0000	.8188	.4727	GAP 5			GAP 5			12.010	24.0
8	16	0.0000	.8868	.5120	.3398	.3902	.3405	-72.8	-71.7	-71.7	.414	102.0
8	17	0.0000	1.0229	.5906	.3440	.2028	.0000	-72.9	-73.8	-75.7	21.779	-162.9
		0.0000	0.0000	0.0000	GAP 6			GAP 6			55.528	-175.7
9	18	0.0000	.0149	-.0086	.8573	.7770	.7277	-102.8	-105.0	-107.7	40.680	-167.7
9	19	0.0000	.0446	-.0258	.7410	.7103	.6855	-107.6	-110.5	-113.5	25.662	-147.6
9	20	0.0000	.0743	-.0430	.6883	.6669	.6464	-113.5	-116.7	-120.1	24.307	-145.4
10	21	0.0000	.1197	-.0692	.6497	.6086	.5624	-120.0	-127.3	-135.5	25.341	-155.6
11	22	0.0000	.2123	-.1226	.5704	.4674	.3781	-135.1	-155.4	174.6	30.263	176.4
12	23	0.0000	.3424	-.1977	.3807	.3628	.4324	176.0	134.7	100.8	31.520	143.1
12	24	0.0000	.4784	-.2764	.4287	.4972	.5098	101.3	78.3	60.1	21.470	93.6
13	25	0.0000	.6144	-.3549	.5079	.4512	.3549	60.2	40.9	14.1	23.164	14.5
13	26	0.0000	.7507	-.4335	.3598	.2956	.3398	14.1	-27.7	-72.8	30.458	-31.1
		0.0000	.8188	-.4727			GAP 7			GAP 7	29.309	-50.7
		0.0000	.8188	-.4727	GAP 8			GAP 8			12.010	24.0
14	27	0.0000	.8868	-.5120	.3398	.3902	.3405	-72.8	-71.7	-71.7	.414	102.0
14	28	0.0000	1.0229	-.5906	.3440	.2028	.0000	-72.9	-73.8	-75.7	21.779	-162.9
		0.0000	0.0000	0.0000	GAP 9			GAP 9			8.219	25.1
15	29	.0156	0.0000	.0073	.0272	.0497	.0918	-70.4	-79.5	-92.1	18.749	-10.7

WIRE NO	INT NO	X WAVELENGTHS	Y WAVELENGTHS	Z WAVELENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG.	DEG	DEG	VOLTS	DEG
15	30	.0467	0.0000	.0218	.0987	.1562	.2205	-94.4	-100.5	-103.9	34.607	-21.4
15	31	.0778	0.0000	.0363	.2224	.2904	.3593	-104.0	-106.2	-107.7	38.450	-23.6
16	32	.1253	0.0000	.0585	.3616	.4996	.6208	-107.8	-109.8	-111.1	35.600	-25.8
17	33	.2221	0.0000	.1037	.6267	.7916	.8068	-111.3	-113.1	-114.3	12.687	-34.5
18	34	.3355	0.0000	.1569	.8113	.7169	.5397	-114.4	-115.2	-115.8	24.675	158.3
18	35	.4325	0.0000	.2027	.5479	.2997	.0000	-115.9	-116.5	-118.8	49.711	154.1
		0.0000	0.0000	0.0000	GAP 10				GAP 10		8.219	25.1
19	36	-.0156	0.0000	-.0073	.0272	.0497	.0918	-70.4	-79.5	-92.1	18.749	-10.7
19	37	-.0467	0.0000	-.0218	.0987	.1562	.2205	-94.4	-100.5	-103.9	34.607	-21.4
19	38	-.0778	0.0000	-.0363	.2224	.2904	.3593	-104.0	-106.2	-107.7	38.450	-23.6
20	39	-.1253	0.0000	-.0585	.3616	.4996	.6208	-107.8	-109.8	-111.1	35.600	-25.8
21	40	-.2221	0.0000	-.1037	.6267	.7916	.8068	-111.3	-113.1	-114.3	12.687	-34.5
22	41	-.3355	0.0000	-.1569	.8113	.7169	.5397	-114.4	-115.2	-115.8	24.675	158.3
22	42	-.4325	0.0000	-.2027	.5479	.2997	.0000	-115.9	-116.5	-118.8	49.711	154.1

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	DEGREES
1	122.881	-562.153	.000371	.001698	0.000	0.000	122.619	-562.273	1000.000	0.0
2	122.881	-562.153	.000371	.001698	0.000	0.000	122.619	-562.273	1000.000	0.0
3					INFINITE	INFINITE	-97.322	16.143	84.577	67.8
6					INFINITE	INFINITE	-97.322	16.143	84.577	67.8
9					INFINITE	INFINITE	-.000	12861.006	349.181	19.6
10					INFINITE	INFINITE	-.000	12861.006	349.181	19.6
4					INFINITE	INFINITE	-600.000	-.000	203.908	-72.8
7					INFINITE	INFINITE	-600.000	-.000	203.908	-72.8

INPUT POWER = 742.223 WATTS
RADIATED POWER = 177.163 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 565.060 WATTS
RADIATION EFFICIENCY = 23.87 PER CENT

WIRE COORDINATES IN FEET AND WIRE RADII IN INCHES

WIRE NO		X1	Y1	Z1	RAD1	X2	Y2	Z2	RAD2	INTERVALS
1	GAP 1	-0.0000	-0.0000	-0.0000	.250000	-0.0000	-0.0000	61.5000	.250000	3
2	GAP 2	-0.0000	-0.0000	-0.0000	.250000	-0.0000	-0.0000	-61.5000	.250000	3
3	GAP 3	-0.0000	-0.0000	-0.0000	.250000	-0.0000	53.2000	30.8000	.250000	3
4		-0.0000	53.2000	30.8000	.250000	-0.0000	89.6000	51.8000	.250000	1
5		-0.0000	89.6000	51.8000	.250000	-0.0000	163.7000	94.5000	.250000	2

WIRE NO		X1	Y1	Z1	RAD1		X2	Y2	Z2	RAD2	INTERVALS
6		-0.0000	163.7000	94.5000	.250000		-0.0000	325.9000	188.3000	.250000	3
7		-0.0000	325.9000	188.3000	.250000	GAP 4	-0.0000	488.4000	282.0000	.250000	3
8	GAP 5	-0.0000	488.4000	282.0000	.250000		-0.0000	650.8000	375.7000	.250000	3
9	GAP 6	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	-30.8000	.250000	3
10		-0.0000	53.2000	-30.8000	.250000		-0.0000	89.6000	-51.8000	.250000	1
11		-0.0000	89.6000	-51.8000	.250000		-0.0000	163.7000	-94.5000	.250000	2
12		-0.0000	163.7000	-94.5000	.250000		-0.0000	325.9000	-188.3000	.250000	3
13		-0.0000	325.9000	-188.3000	.250000	GAP 7	-0.0000	488.4000	-282.0000	.250000	3
14	GAP 8	-0.0000	488.4000	-282.0000	.250000		-0.0000	650.8000	-375.7000	.250000	3
15	GAP 9	-0.0000	-0.0000	-0.0000	.290000		55.7000	-0.0000	26.0000	.290000	3
16		55.7000	-0.0000	26.0000	.290000		93.8000	-0.0000	43.8000	.290000	1
17		93.8000	-0.0000	43.8000	.290000		171.2000	-0.0000	79.9000	.290000	2
18		171.2000	-0.0000	79.9000	.290000		286.9000	-0.0000	134.6000	.290000	2
19	GAP 10	-0.0000	-0.0000	-0.0000	.290000		-55.7000	-0.0000	-26.0000	.290000	3
20		-55.7000	-0.0000	-26.0000	.290000		-93.8000	-0.0000	-43.8000	.290000	1
21		-93.8000	-0.0000	-43.8000	.290000		-171.2000	-0.0000	-79.9000	.290000	2
22		-171.2000	-0.0000	-79.9000	.290000		-286.9000	-0.0000	-134.6000	.290000	2

FREQUENCY = 2.2000 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 292

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 18.9 PER CENT FOR GAPS 9 AND 3

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	RICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP	CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3-	0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6-	0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3-	0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6-	0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4-	0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7-	0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9-	0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9-	10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1-	0	*610000.0000	-0.0000	-0.0000	-0.0000
10	IMP	2-	0	*610000.0000	-0.0000	-0.0000	-0.0000
11	IMP	1-	2	817000.0000	-0.0000	-0.0000	-0.0000

		COORDINATES			CURRENT DISTRIBUTION						NORMAL ELECTRIC FIELD * RADIUS	
		X	Y	Z	AMPLITUDE			PHASE				
WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			186.246	.0
1	1	0.0000	0.0000	.0229	2.8130	2.3680	1.9327	88.9	88.7	88.6	184.123	-.4
1	2	0.0000	0.0000	.0687	1.9605	1.5160	1.0435	88.6	88.5	88.3	191.775	-1.1
1	3	0.0000	0.0000	.1146	1.0618	.5530	.0000	88.3	88.2	86.1	222.044	-1.7
		0.0000	0.0000	0.0000	GAP 2			GAP 2			186.246	-180.0
2	4	0.0000	0.0000	-.0229	2.8130	2.3680	1.9327	-91.1	-91.3	-91.4	184.123	179.6
2	5	0.0000	0.0000	-.0687	1.9605	1.5160	1.0435	-91.4	-91.5	-91.7	191.775	178.9
2	6	0.0000	0.0000	-.1146	1.0618	.5530	.0000	-91.7	-91.8	-93.9	222.044	178.3
		0.0000	0.0000	-.0000	GAP 3			GAP 3			21.563	175.0
3	7	0.0000	.0198	.0115	.0821	.0469	.0346	-69.2	-46.1	-14.2	14.318	176.4
3	8	0.0000	.0595	.0344	.0361	.0322	.0298	-23.1	-2.3	8.5	3.967	-168.4
3	9	0.0000	.0991	.0574	.0295	.0251	.0192	5.7	6.7	-4.0	2.315	-67.2
4	10	0.0000	.1596	.0923	.0193	.0232	.0512	-10.9	-82.0	-108.3	5.886	-38.0
5	11	0.0000	.2417	.1396	.0540	.0875	.1179	-107.8	-115.5	-119.6	6.692	-39.3
5	12	0.0000	.3245	.1874	.1191	.1422	.1547	-119.5	-122.4	-125.1	3.857	-53.1
6	13	0.0000	.4263	.2462	.1558	.1520	.1219	-125.1	-129.5	-136.3	3.057	178.0
6	14	0.0000	.5472	.3161	.1229	.0739	.0385	-136.4	-152.1	141.9	8.714	151.6
6	15	0.0000	.6680	.3859	.0389	.0798	.1305	142.4	83.1	68.4	8.869	141.0
7	16	0.0000	.7890	.4558	.1307	.1620	.1657	68.5	61.4	55.9	3.363	109.0
7	17	0.0000	.9101	.5256	.1660	.1407	.0919	55.9	49.7	38.6	5.843	-14.9
7	18	0.0000	1.0311	.5954	.0930	.0391	.0620	38.2	-3.8	-94.2	10.047	-33.0
		0.0000	1.0917	.6303			GAP 4			GAP 4	9.752	-39.7
		0.0000	1.0917	.6303	GAP 5			GAP 5			7.967	-4.8
8	19	0.0000	1.1522	.6652	.0620	.1125	.1416	-94.2	-94.9	-96.0	5.621	-7.4
8	20	0.0000	1.2732	.7350	.1419	.1438	.1177	-96.6	-97.5	-98.3	1.737	-178.2
8	21	0.0000	1.3942	.8049	.1196	.0685	.0000	-98.6	-99.3	77.6	8.445	171.4
		0.0000	-.0000	.0000	GAP 6			GAP 6			21.563	-5.0
9	22	0.0000	.0198	-.0115	.0821	.0469	.0346	110.8	133.9	165.8	14.318	-3.6
9	23	0.0000	.0595	-.0344	.0361	.0322	.0298	156.9	177.7	-171.5	3.967	11.6

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
9	24	0.0000	.0991	-.0574	.0295	.0251	.0192	-174.3	-173.3	176.0	2.315	112.8
10	25	0.0000	.1596	-.0923	.0193	.0232	.0512	169.1	98.0	71.7	5.886	142.0
11	26	0.0000	.2417	-.1396	.0540	.0875	.1179	72.2	64.5	60.4	6.692	140.7
11	27	0.0000	.3245	-.1874	.1191	.1422	.1547	60.5	57.6	54.9	3.857	126.9
12	28	0.0000	.4263	-.2462	.1558	.1520	.1219	54.9	50.5	43.7	3.057	-2.0
12	29	0.0000	.5472	-.3161	.1229	.0739	.0385	43.6	27.9	-38.1	8.714	-28.4
12	30	0.0000	.6680	-.3859	.0389	.0798	.1305	-37.6	-96.9	-111.6	8.869	-39.0
13	31	0.0000	.7890	-.4558	.1307	.1620	.1657	-111.5	-118.6	-124.1	3.363	-71.0
13	32	0.0000	.9101	-.5256	.1660	.1407	.0919	-124.1	-130.3	-141.4	5.843	165.1
13	33	0.0000	1.0311	-.5954	.0930	.0391	.0620	-141.8	176.2	85.8	10.047	147.0
		0.0000	1.0917	-.6303			GAP 7			GAP 7	9.752	140.3
		0.0000	1.0917	-.6303	GAP 8			GAP 8			7.967	175.2
14	34	0.0000	1.1522	-.6652	.0620	.1125	.1416	85.8	85.1	84.0	5.621	172.6
14	35	0.0000	1.2732	-.7350	.1419	.1438	.1177	83.4	82.5	81.7	1.737	1.8
14	36	0.0000	1.3942	-.8049	.1196	.0685	.0000	81.4	80.7	-102.4	8.445	-8.6
		-.0000	0.0000	-.0000	GAP 9			GAP 9			15.017	179.9
15	37	.0208	0.0000	.0097	.0482	.0651	.0762	23.5	48.1	57.2	9.410	-176.4
15	38	.0623	0.0000	.0291	.0732	.0756	.0717	55.6	60.1	63.0	1.975	-111.2
15	39	.1038	0.0000	.0484	.0707	.0611	.0469	62.6	64.7	67.0	5.061	-35.9
16	40	.1671	0.0000	.0780	.0453	.0053	.0444	66.2	96.2	-119.6	9.238	-26.7
17	41	.2529	0.0000	.1181	.0464	.0979	.1448	-118.6	-116.9	-116.4	9.994	-25.4
17	42	.3394	0.0000	.1584	.1458	.1827	.2054	-116.4	-116.3	-116.3	6.060	-26.0
18	43	.4473	0.0000	.2092	.2067	.2089	.1707	-116.4	-116.5	-116.8	2.489	155.6
18	44	.5766	0.0000	.2703	.1743	.0998	.0000	-117.0	-117.4	56.5	12.041	153.0
		.0000	0.0000	.0000	GAP 10			GAP 10			15.017	-.1
19	45	-.0208	0.0000	-.0097	.0482	.0651	.0762	-156.5	-131.9	-122.8	9.410	3.6
19	46	-.0623	0.0000	-.0291	.0732	.0756	.0717	-124.4	-119.9	-117.0	1.975	68.8
19	47	-.1038	0.0000	-.0484	.0707	.0611	.0469	-117.4	-115.3	-113.0	5.061	144.1
20	48	-.1671	0.0000	-.0780	.0453	.0053	.0444	-113.8	-83.8	60.4	9.238	153.3
21	49	-.2529	0.0000	-.1181	.0464	.0979	.1448	61.4	63.1	63.6	9.994	154.6
21	50	-.3394	0.0000	-.1584	.1458	.1827	.2054	63.6	63.7	63.7	6.060	154.0
22	51	-.4473	0.0000	-.2092	.2067	.2089	.1707	63.6	63.5	63.2	2.489	-24.4
22	52	-.5766	0.0000	-.2703	.1743	.0998	.0000	63.0	62.6	-123.5	12.041	-27.0

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	7.054	-355.412	.000056	.002813	0.000	0.000	6.773	-355.423	1000.000	0.0
2	7.054	-355.412	.000056	.002813	0.000	0.000	6.773	-355.423	1000.000	-180.0
3					INFINITE	INFINITE	-95.337	21.085	8.021	98.4
6					INFINITE	INFINITE	-95.337	21.085	8.021	-81.6
9					INFINITE	INFINITE	.000	-.000	.000	-45.2
10					INFINITE	INFINITE	-.000	.000	.000	-45.2
4					INFINITE	INFINITE	-600.000	-.000	37.204	-94.2

	OHMS	OHMS	MHOS	MHOS	OHMS	OHMS	OHMS	OHMS	VOLT DEGREES	
7					INFINITE	INFINITE	-600.000	-.000	37.204	85.8

INPUT POWER = 111.647 WATTS
RADIATED POWER = 95.383 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 16.263 WATTS
RADIATION EFFICIENCY = 85.43 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

		COORDINATES			CURRENT DISTRIBUTION						NORMAL ELECTRIC FIELD * RADIUS	
		X	Y	Z	AMPLITUDE			PHASE				
WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			151.802	-9.8
1	1	0.0000	0.0000	.0229	2.2261	1.8653	1.5153	77.2	76.7	76.4	148.734	-11.1
1	2	0.0000	0.0000	.0687	1.5371	1.1832	.8108	76.5	76.3	76.1	151.884	-13.1
1	3	0.0000	0.0000	.1146	.8250	.4278	.0000	76.2	76.0	73.6	172.516	-13.8
		0.0000	0.0000	0.0000	GAP 2			GAP 2			151.802	-9.8
2	4	0.0000	0.0000	-.0229	2.2261	1.8653	1.5153	77.2	76.7	76.4	148.734	-11.1
2	5	0.0000	0.0000	-.0687	1.5371	1.1832	.8108	76.5	76.3	76.1	151.884	-13.1
2	6	0.0000	0.0000	-.1146	.8250	.4278	.0000	76.2	76.0	73.6	172.516	-13.8
		0.0000	-.0000	-.0000	GAP 3			GAP 3			56.728	-175.7
3	7	0.0000	.0198	.0115	1.1046	.9819	.8749	-103.5	-105.9	-108.8	51.691	-174.4
3	8	0.0000	.0595	.0344	.8869	.7861	.6828	-108.7	-112.2	-116.7	48.281	-174.6
3	9	0.0000	.0991	.0574	.6853	.5808	.4783	-116.6	-122.6	-131.0	52.749	-178.4

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IRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
					AMPLITUDE			PHASE				
4	10	0.0000	.1596	.0923	.4810	.3165	.3276	-130.9	-163.4	146.1	56.555	175.5
5	11	0.0000	.2417	.1396	.3264	.4903	.6728	146.6	116.9	103.4	49.579	166.2
5	12	0.0000	.3245	.1874	.6715	.8157	.8990	103.5	95.7	90.2	29.435	148.0
6	13	0.0000	.4263	.2462	.8982	.8900	.7314	90.2	83.3	75.3	19.000	44.8
6	14	0.0000	.5472	.3161	.7312	.4619	.2269	75.4	60.5	6.3	48.326	3.5
6	15	0.0000	.6680	.3859	.2252	.3953	.6699	6.7	-63.1	-81.3	49.394	-10.1
7	16	0.0000	.7890	.4558	.6685	.8444	.8722	-81.4	-89.6	-95.7	19.697	-42.2
7	17	0.0000	.9101	.5256	.8718	.7441	.4905	-95.8	-102.4	-113.8	30.535	-165.3
7	18	0.0000	1.0311	.5954	.4945	.2120	.3258	-114.2	-155.8	114.3	53.011	174.8
		0.0000	1.0917	.6303			GAP 4			GAP 4	51.621	167.6
		0.0000	1.0917	.6303	GAP 5			GAP 5			41.709	-157.6
8	19	0.0000	1.1522	.6652	.3258	.5894	.7401	114.3	112.9	111.6	29.293	-160.5
8	20	0.0000	1.2732	.7350	.7414	.7496	.6122	111.0	109.8	109.0	9.274	30.4
8	21	0.0000	1.3942	.8049	.6216	.3550	.0000	108.7	107.9	-75.4	43.888	18.7
		0.0000	-.0000	.0000	GAP 6			GAP 6			56.728	-175.7
9	22	0.0000	.0198	.0115	1.1046	.9819	.8749	-103.5	-105.9	-108.8	51.691	-174.4
9	23	0.0000	.0595	-.0344	.8869	.7861	.6828	-108.7	-112.2	-116.7	48.281	-174.6
9	24	0.0000	.0991	-.0574	.6853	.5808	.4783	-116.6	-122.6	-131.0	52.749	-178.4
10	25	0.0000	.1596	-.0923	.4810	.3165	.3276	-130.9	-163.4	146.1	56.555	175.5
11	26	0.0000	.2417	-.1396	.3264	.4903	.6728	146.6	116.9	103.4	49.579	166.2
11	27	0.0000	.3245	-.1874	.6715	.8157	.8990	103.5	95.7	90.2	29.435	148.0
12	28	0.0000	.4263	-.2462	.8982	.8900	.7314	90.2	83.3	75.3	19.000	44.8
12	29	0.0000	.5472	-.3161	.7312	.4619	.2269	75.4	60.5	6.3	48.326	3.5
12	30	0.0000	.6680	-.3859	.2252	.3953	.6699	6.7	-63.1	-81.3	49.394	-10.1
13	31	0.0000	.7890	-.4558	.6685	.8444	.8722	-81.4	-89.6	-95.7	19.697	-42.2
13	32	0.0000	.9101	-.5256	.8718	.7441	.4905	-95.8	-102.4	-113.8	30.535	-165.3
13	33	0.0000	1.0311	-.5954	.4945	.2120	.3258	-114.2	-155.8	114.3	53.011	174.8
		0.0000	1.0917	-.6303			GAP 7			GAP 7	51.621	167.6
		0.0000	1.0917	-.6303	GAP 8			GAP 8			41.709	-157.6
14	34	0.0000	1.1522	-.6652	.3258	.5894	.7401	114.3	112.9	111.6	29.293	-160.5
14	35	0.0000	1.2732	-.7350	.7414	.7496	.6122	111.0	109.8	109.0	9.274	30.4
14	36	0.0000	1.3942	-.8049	.6216	.3550	.0000	108.7	107.9	-75.4	43.888	18.7
		-.0000	0.0000	-.0000	GAP 9			GAP 9			29.311	135.4
15	37	.0208	0.0000	.0097	.0317	.0662	.0971	-45.2	16.4	25.5	19.178	134.6
15	38	.0623	0.0000	.0291	.0890	.1050	.1135	23.2	26.2	27.5	5.372	132.7
15	39	.1038	0.0000	.0484	.1117	.1140	.1118	27.1	27.8	28.3	.496	-156.1
16	40	.1671	0.0000	.0780	.1098	.0939	.0694	27.9	29.2	33.1	4.251	-70.9
17	41	.2529	0.0000	.1181	.0674	.0391	.0211	33.1	46.3	99.1	6.290	-75.0
17	42	.3394	0.0000	.1584	.0216	.0355	.0553	100.9	154.5	168.5	5.197	-78.5
18	43	.4473	0.0000	.2092	.0561	.0732	.0690	167.3	173.3	175.0	1.068	-65.7
18	44	.5766	0.0000	.2703	.0701	.0439	.0000	173.2	173.1	-7.5	4.838	83.2
		.0000	0.0000	.0000	GAP 10			GAP 10			29.311	135.4
19	45	-.0208	0.0000	-.0097	.0317	.0662	.0971	-45.2	16.4	25.5	19.178	134.6
19	46	-.0623	0.0000	-.0291	.0890	.1050	.1135	23.2	26.2	27.5	5.372	132.7
19	47	-.1038	0.0000	-.0484	.1117	.1140	.1118	27.1	27.8	28.3	.496	-156.1
20	48	-.1671	0.0000	-.0780	.1098	.0939	.0694	27.9	29.2	33.1	4.251	-70.9
21	49	-.2529	0.0000	-.1181	.0674	.0391	.0211	33.1	46.3	99.1	6.290	-75.0
21	50	-.3394	0.0000	-.1584	.0216	.0355	.0553	100.9	154.5	168.5	5.197	-78.5
22	51	-.4473	0.0000	-.2092	.0561	.0732	.0690	167.3	173.3	175.0	1.068	-65.7
22	52	-.5766	0.0000	-.2703	.0701	.0439	.0000	173.2	173.1	-7.5	4.838	83.2

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	99.685	-438.027	.000494	.002171	0.000	0.000	99.724	-438.008	1000.000	0.0
2	99.685	-438.027	.000494	.002171	0.000	0.000	99.724	-438.008	1000.000	0.0
3					INFINITE	INFINITE	-95.337	21.085	107.856	64.0
6					INFINITE	INFINITE	-95.337	21.085	107.856	64.0
9					INFINITE	INFINITE	-.000	9645.754	306.213	44.8
10					INFINITE	INFINITE	-.000	9645.754	306.213	44.8
4					INFINITE	INFINITE	-600.000	.000	195.497	114.3
7					INFINITE	INFINITE	-600.000	.000	195.497	114.3

INPUT POWER =	987.936 WATTS
RADIATED POWER =	268.261 WATTS
WIRE LOSS =	.000 WATTS
NETWORK LOSS =	719.675 WATTS
RADIATION EFFICIENCY =	27.15 PER CENT

WIRE COORDINATES IN FEET AND WIRE RADII IN INCHES

WIRE NO		X1	Y1	Z1	RAD1		X2	Y2	Z2	RAD2	INTERVALS
1	GAP 1	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	61.5000	.250000	3
2	GAP 2	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	-61.5000	.250000	3
3	GAP 3	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	30.8000	.250000	3
4		-0.0000	53.2000	30.8000	.250000		-0.0000	89.6000	51.8000	.250000	1
5		-0.0000	89.6000	51.8000	.250000		-0.0000	163.7000	94.5000	.250000	2
6		-0.0000	163.7000	94.5000	.250000		-0.0000	325.9000	188.3000	.250000	4
7		-0.0000	325.9000	188.3000	.250000	GAP 4	-0.0000	488.4000	282.0000	.250000	4
8	GAP 5	-0.0000	488.4000	282.0000	.250000		-0.0000	650.8000	375.7000	.250000	4
9	GAP 6	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	-30.8000	.250000	3
10		-0.0000	53.2000	-30.8000	.250000		-0.0000	89.6000	-51.8000	.250000	1
11		-0.0000	89.6000	-51.8000	.250000		-0.0000	163.7000	-94.5000	.250000	2
12		-0.0000	163.7000	-94.5000	.250000		-0.0000	325.9000	-188.3000	.250000	4
13		-0.0000	325.9000	-188.3000	.250000	GAP 7	-0.0000	488.4000	-282.0000	.250000	4
14	GAP 8	-0.0000	488.4000	-282.0000	.250000		-0.0000	650.8000	-375.7000	.250000	4
15	GAP 9	-0.0000	-0.0000	-0.0000	.290000		55.7000	-0.0000	26.0000	.290000	3
16		55.7000	-0.0000	26.0000	.290000		93.8000	-0.0000	43.8000	.290000	1
17		93.8000	-0.0000	43.8000	.290000		171.2000	-0.0000	79.9000	.290000	2
18		171.2000	-0.0000	79.9000	.290000		286.9000	-0.0000	134.6000	.290000	3
19	GAP 10	-0.0000	-0.0000	-0.0000	.290000		-55.7000	-0.0000	-26.0000	.290000	3
20		-55.7000	-0.0000	-26.0000	.290000		-93.8000	-0.0000	-43.8000	.290000	1
21		-93.8000	-0.0000	-43.8000	.290000		-171.2000	-0.0000	-79.9000	.290000	2
		-171.2000	-0.0000	-79.9000	.290000		-286.9000	-0.0000	-134.6000	.290000	3

FREQUENCY = 2.8000 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 380

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 26.0 PER CENT FOR GAPS 3 AND

EXCITATION MODE

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	N	NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3-	0	100.0000	-0.0000	-0.0000	-0.0000	
2	IMP	6-	0	100.0000	-0.0000	-0.0000	-0.0000	
3	IMP	3-	0	-0.0000	-0.0000	160.0000	-0.0000	
4	IMP	6-	0	-0.0000	-0.0000	160.0000	-0.0000	
5	IMP	4-	0	600.0000	-0.0000	-0.0000	-0.0000	
6	IMP	7-	0	600.0000	-0.0000	-0.0000	-0.0000	
7	IMP	9-	0	-0.0000	-0.0000	15.0000	-0.0000	
8	IMP	9-	10	-0.0000	-0.0000	-0.0000	-0.0000	

COORDINATES

CURRENT DISTRIBUTION

NORMAL ELECTRIC FIELD * RADIUS

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP.	AMP.	PHASE DEG.	DEG.	DEG	VOLTS	DEG.
		0.0000	0.0000	0.0000	GAP 1			GAP 1			186.179	
1	1	0.0000	0.0000	.0292	4.7662	4.1601	3.4914	87.3	87.0	86.7	210.031	-1.(
1	2	0.0000	0.0000	.0875	3.5300	2.7823	1.9418	86.7	86.5	86.3	261.538	-2.8
1	3	0.0000	0.0000	.1458	1.9747	1.0368	.0000	86.3	86.1	85.9	325.164	-3.7
		0.0000	0.0000	0.0000	GAP 2			GAP 2			186.179	-179.8
2	4	0.0000	0.0000	-.0292	4.7662	4.1601	3.4914	-92.7	-93.0	-93.3	210.031	179.0
2	5	0.0000	0.0000	-.0875	3.5300	2.7823	1.9418	-93.3	-93.5	-93.7	261.538	177.2
2	6	0.0000	0.0000	-.1458	1.9747	1.0368	.0000	-93.7	-93.9	-94.1	325.164	176.3
		0.0000	0.0000	0.0000	GAP 3			GAP 3			20.052	172.5
3	7	0.0000	.0252	.0146	.1570	.1168	.0999	-127.0	-138.5	-146.1	11.645	170.7
3	8	0.0000	.0757	.0438	.1053	.1014	.1052	-142.7	-143.1	-139.1	1.095	39.4
3	9	0.0000	.1261	.0730	.1071	.1180	.1344	-138.1	-132.1	-126.2	6.086	.7
4	10	0.0000	.2031	.1175	.1386	.1829	.2217	-125.3	-116.6	-112.1	7.549	-2.2
5	11	0.0000	.3076	.1777	.2281	.2481	.2383	-112.0	-110.0	-109.7	1.104	21.1
5	12	0.0000	.4130	.2385	.2412	.1999	.1307	-109.9	-111.3	-116.1	9.021	167.3
6	13	0.0000	.5234	.3022	.1322	.0431	.0838	-116.6	-150.5	98.4	15.245	166.9
6	14	0.0000	.6387	.3689	.0843	.1767	.2445	99.2	86.0	81.7	12.258	162.9
6	15	0.0000	.7541	.4356	.2452	.2738	.2573	81.8	79.1	76.5	1.938	106.5
6	16	0.0000	.8694	.5023	.2581	.1987	.1071	76.6	72.9	63.7	11.474	-4.6
7	17	0.0000	.9849	.5690	.1076	.0324	.1238	63.8	-26.4	-87.3	16.523	-10.7
7	18	0.0000	1.1005	.6356	.1239	.2131	.2677	-87.2	-94.8	-98.2	10.914	-17.4
7	19	0.0000	1.2160	.7023	.2683	.2774	.2389	-98.1	-100.8	-103.7	2.822	-150.8
7	20	0.0000	1.3316	.7689	.2403	.1599	.0565	-103.4	-108.9	-135.7	14.367	175.5
		0.0000	1.3894	.8022			GAP 4			GAP 4	17.352	173.1
		0.0000	1.3894	.8022	GAP 5			GAP 5			14.320	155.9
8	21	0.0000	1.4472	.8356	.0565	.0547	.1497	-135.7	88.0	73.7	14.815	155.7
8	22	0.0000	1.5627	.9022	.1507	.2244	.2615	74.0	70.9	69.5	8.254	153.4
8	23	0.0000	1.6782	.9688	.2625	.2553	.2040	69.5	68.6	67.9	4.341	-15.0
8	24	0.0000	1.7936	1.0355	.2077	.1174	.0000	67.8	67.2	122.6	15.316	-22.2
		0.0000	0.0000	0.0000	GAP 6			GAP 6			20.052	-7.5
9	25	0.0000	.0252	-.0146	.1570	.1168	.0999	53.0	41.5	33.9	11.645	-9.3
9	26	0.0000	.0757	-.0438	.1053	.1014	.1052	37.3	36.9	40.9	1.095	-140.6
9	27	0.0000	.1261	-.0730	.1071	.1180	.1344	41.9	47.9	53.8	6.086	-179.3
10	28	0.0000	.2031	-.1175	.1386	.1829	.2217	54.7	63.4	67.9	7.549	177.8
11	29	0.0000	.3076	-.1777	.2281	.2481	.2383	68.0	70.0	70.3	1.104	-158.9
11	30	0.0000	.4130	-.2385	.2412	.1999	.1307	70.1	68.7	63.9	9.021	-12.7
12	31	0.0000	.5234	-.3022	.1322	.0431	.0838	63.4	29.5	-81.6	15.245	-13.1
12	32	0.0000	.6387	-.3689	.0843	.1767	.2445	-80.8	-94.0	-98.3	12.258	-17.1
12	33	0.0000	.7541	-.4356	.2452	.2738	.2573	-98.2	-100.9	-103.5	1.938	-73.5
12	34	0.0000	.8694	-.5023	.2581	.1987	.1071	-103.4	-107.1	-116.3	11.474	175.4
13	35	0.0000	.9849	-.5690	.1076	.0324	.1238	-116.2	153.6	92.7	16.523	169.3
13	36	0.0000	1.1005	-.6356	.1239	.2131	.2677	92.8	85.2	81.8	10.914	162.6
13	37	0.0000	1.2160	-.7023	.2683	.2774	.2389	81.9	79.2	76.3	2.822	29.2
13	38	0.0000	1.3316	-.7689	.2403	.1599	.0565	76.6	71.1	44.3	14.367	-4.5
		0.0000	1.3894	-.8022			GAP 7			GAP 7	17.352	-6.9
		0.0000	1.3894	-.8022	GAP 8			GAP 8			14.320	-24.1
14	39	0.0000	1.4472	-.8356	.0565	.0547	.1497	44.3	-92.0	-106.3	14.815	-24.3

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
14	40	0.0000	1.5627	-.9022	.1507	.2244	.2615	-106.0	-109.1	-110.5	8.254	-26.6
14	41	0.0000	1.6782	-.9688	.2625	.2553	.2040	-110.5	-111.4	-112.1	4.341	165.0
14	42	0.0000	1.7936	-1.0355	.2077	.1174	.0000	-112.2	-112.8	-57.4	15.316	157.8
		0.0000	0.0000	0.0000	GAP 9			GAP 9			16.111	179.2
15	43	.0264	0.0000	.0123	.3554	.3130	.2819	-104.5	-106.3	-107.7	12.459	177.5
15	44	.0792	0.0000	.0370	.2872	.2629	.2409	-107.3	-108.3	-109.1	7.743	172.0
15	45	.1320	0.0000	.0616	.2428	.2219	.2008	-109.0	-109.7	-110.4	6.988	168.1
16	46	.2126	0.0000	.0993	.2044	.1599	.1097	-110.2	-112.0	-116.3	7.847	166.8
17	47	.3219	0.0000	.1503	.1147	.0613	.0273	-115.6	-127.8	162.2	9.201	168.1
17	48	.4320	0.0000	.2016	.0276	.0609	.1020	167.3	105.6	94.1	7.863	168.4
18	49	.5419	0.0000	.2532	.1013	.1291	.1391	94.6	90.5	88.5	3.214	162.8
18	50	.6516	0.0000	.3051	.1393	.1295	.1008	88.7	87.6	86.7	3.125	3.9
18	51	.7613	0.0000	.3570	.1027	.0574	.0000	86.8	86.3	-98.3	8.284	-3.2
		0.0000	0.0000	0.0000	GAP 10			GAP 10			16.111	-.8
19	52	-.0264	0.0000	-.0123	.3554	.3130	.2819	75.5	73.7	72.3	12.459	-2.5
19	53	-.0792	0.0000	-.0370	.2872	.2629	.2409	72.7	71.7	70.9	7.743	-8.0
19	54	-.1320	0.0000	-.0616	.2428	.2219	.2008	71.0	70.3	69.6	6.988	-11.9
20	55	-.2126	0.0000	-.0993	.2044	.1599	.1097	69.8	68.0	63.7	7.847	-13.2
21	56	-.3219	0.0000	-.1503	.1147	.0613	.0273	64.4	52.2	-17.8	9.201	-11.9
21	57	-.4320	0.0000	-.2016	.0276	.0609	.1020	-12.7	-74.4	-85.9	7.863	-11.6
22	58	-.5419	0.0000	-.2532	.1013	.1291	.1391	-85.4	-89.5	-91.5	3.214	-17.2
22	59	-.6516	0.0000	-.3051	.1393	.1295	.1008	-91.3	-92.4	-93.3	3.125	-176.1
22	60	-.7613	0.0000	-.3570	.1027	.0574	.0000	-93.2	-93.7	-81.7	8.284	176.8

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	DEGREES
1	9.927	-209.576	.000226	.004761	0.000	0.000	9.927	-209.576	1000.000	0.0
2	9.927	-209.576	.000226	.004761	0.000	0.000	9.927	-209.576	1000.000	-180.0
3					INFINITE	INFINITE	-92.658	26.082	15.111	37.3
6					INFINITE	INFINITE	-92.658	26.082	15.111	-142.7
9					INFINITE	INFINITE	.000	.000	.000	-74.4
10					INFINITE	INFINITE	-.000	-.000	.000	-74.4
4					INFINITE	INFINITE	-600.000	-.000	33.884	-135.7
7					INFINITE	INFINITE	-600.000	.000	33.884	44.3

INPUT POWER = 451.032 WATTS
RADIATED POWER = 434.244 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 16.788 WATTS
RADIATION EFFICIENCY = 96.28 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

WIRE NO	INT NO	COORDINATES X WAVELENGTHS	Y WAVELENGTHS	Z WAVELENGTHS	CURRENT DISTRIBUTION AMPLITUDE			PHASE DEG	DEG	DEG	NORMAL ELECTRIC FIELD * RADIUS VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			118.915	-11.5
1	1	0.0000	0.0000	.0292	2.4534	2.0857	1.7156	74.9	74.4	74.1	121.579	-13.1
1	2	0.0000	0.0000	.0875	1.7434	1.3554	.9345	74.2	74.0	73.8	133.199	-15.4
1	3	0.0000	0.0000	.1458	.9519	.4950	.0000	73.9	73.8	73.6	156.738	-16.1
		0.0000	0.0000	0.0000	GAP 2			GAP 2			118.915	-11.5
2	4	0.0000	0.0000	-.0292	2.4534	2.0857	1.7156	74.9	74.4	74.1	121.579	-13.1
2	5	0.0000	0.0000	-.0875	1.7434	1.3554	.9345	74.2	74.0	73.8	133.199	-15.4
2	6	0.0000	0.0000	-.1458	.9519	.4950	.0000	73.9	73.8	73.6	156.738	-16.1
		0.0000	0.0000	0.0000	GAP 3			GAP 3			86.778	-178.8
3	7	0.0000	.0252	.0146	1.1847	.9379	.7109	-106.3	-111.0	-118.1	83.979	-179.8
3	8	0.0000	.0757	.0438	.7260	.5178	.3494	-117.6	-129.4	-154.0	80.822	177.4
3	9	0.0000	.1261	.0730	.3511	.3049	.4175	-153.6	163.2	128.9	79.748	173.8
4	10	0.0000	.2031	.1175	.4153	.7765	1.0802	129.3	103.6	94.6	63.431	166.8
5	11	0.0000	.3076	.1777	1.0769	1.2446	1.2416	94.6	89.3	84.9	20.620	129.6
5	12	0.0000	.4130	.2385	1.2405	1.0666	.7511	84.9	80.2	72.7	42.726	12.4
6	13	0.0000	.5234	.3022	.7508	.3282	.3389	72.8	46.3	-56.0	73.704	-1.9
6	14	0.0000	.6387	.3689	.3377	.7574	1.0860	-56.1	-81.1	-88.7	60.643	-11.5
6	15	0.0000	.7541	.4356	1.0856	1.2364	1.1798	-88.7	-93.3	-97.6	14.661	-64.9
6	16	0.0000	.8694	.5023	1.1798	.9267	.5323	-97.5	-103.2	-116.1	51.370	-173.4
7	17	0.0000	.9849	.5690	.5320	.2187	.5602	-115.9	172.1	107.3	74.854	176.3
7	18	0.0000	1.1005	.6356	.5598	.9530	1.1999	107.2	95.5	90.4	50.406	166.6
7	19	0.0000	1.2160	.7023	1.2010	1.2473	1.0822	90.4	86.7	82.9	14.096	48.3

WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
7	20	0.0000	1.3316	.7689	1.0867	.7358	.2852	83.1	76.7	50.4	63.450	3.4
		0.0000	1.3894	.8022			GAP 4			GAP 4	76.702	-.1
		0.0000	1.3894	.8022	GAP 5			GAP 5			62.338	-19.3
8	21	0.0000	1.4472	.8356	.2852	.2066	.6171	50.4	-81.6	-101.1	64.780	-20.0
8	22	0.0000	1.5627	.9022	.6209	.9454	1.1121	-100.8	-104.6	-106.4	36.719	-23.4
8	23	0.0000	1.6782	.9688	1.1156	1.0906	.8741	-106.5	-107.7	-108.6	18.000	170.8
8	24	0.0000	1.7936	1.0355	.8890	.5033	.0000	-108.7	-109.4	-41.6	65.564	161.3
		0.0000	0.0000	0.0000	GAP 6			GAP 6			86.778	-178.8
9	25	0.0000	.0252	-.0146	1.1847	.9379	.7109	-106.3	-111.0	-118.1	83.979	-179.8
9	26	0.0000	.0757	-.0438	.7260	.5178	.3494	-117.6	-129.4	-154.0	80.822	177.4
9	27	0.0000	.1261	-.0730	.3511	.3049	.4175	-153.6	163.2	128.9	79.748	173.8
10	28	0.0000	.2031	-.1175	.4153	.7765	1.0802	129.3	103.6	94.6	63.431	166.8
11	29	0.0000	.3076	-.1777	1.0769	1.2446	1.2416	94.6	89.3	84.9	20.620	129.6
11	30	0.0000	.4130	-.2385	1.2405	1.0666	.7511	84.9	80.2	72.7	42.726	12.4
12	31	0.0000	.5234	-.3022	.7508	.3282	.3389	72.8	46.3	-56.0	73.704	-1.9
12	32	0.0000	.6387	-.3689	.3377	.7574	1.0860	-56.1	-81.1	-88.7	60.643	-11.5
12	33	0.0000	.7541	-.4356	1.0856	1.2364	1.1798	-88.7	-93.3	-97.6	14.661	-64.9
12	34	0.0000	.8694	-.5023	1.1798	.9267	.5323	-97.5	-103.2	-116.1	51.370	-173.4
13	35	0.0000	.9849	-.5690	.5320	.2187	.5602	-115.9	172.1	107.3	74.854	176.3
13	36	0.0000	1.1005	-.6356	.5598	.9530	1.1999	107.2	95.5	90.4	50.406	166.6
13	37	0.0000	1.2160	-.7023	1.2010	1.2473	1.0822	90.4	86.7	82.9	14.096	48.3
13	38	0.0000	1.3316	-.7689	1.0867	.7358	.2852	83.1	76.7	50.4	63.450	3.4
		0.0000	1.3894	-.8022			GAP 7			GAP 7	76.702	-.1
		0.0000	1.3894	-.8022	GAP 8			GAP 8			62.338	-19.3
14	39	0.0000	1.4472	-.8356	.2852	.2066	.6171	50.4	-81.6	-101.1	64.780	-20.0
14	40	0.0000	1.5627	-.9022	.6209	.9454	1.1121	-100.8	-104.6	-106.4	36.719	-23.4
14	41	0.0000	1.6782	-.9688	1.1156	1.0906	.8741	-106.5	-107.7	-108.6	18.000	170.8
14	42	0.0000	1.7936	-1.0355	.8890	.5033	.0000	-108.7	-109.4	-41.6	65.564	161.3
		0.0000	0.0000	0.0000	GAP 9			GAP 9			55.782	20.9
15	43	.0264	0.0000	.0123	.0983	.2505	.3638	-74.4	-71.6	-71.8	43.758	19.2
15	44	.0792	0.0000	.0370	.3523	.4345	.4945	-72.2	-72.6	-73.0	23.450	14.9
15	45	.1320	0.0000	.0616	.4930	.5301	.5447	-73.1	-73.5	-73.7	8.557	11.3
16	46	.2126	0.0000	.0993	.5435	.5027	.3759	-73.8	-73.8	-72.6	13.719	-166.4
17	47	.3219	0.0000	.1503	.3737	.1789	.0726	-72.7	-66.4	67.1	34.770	-169.0
17	48	.4320	0.0000	.2016	.0748	.3026	.5042	67.6	92.5	95.3	35.391	-170.1
18	49	.5419	0.0000	.2532	.5066	.6430	.6919	95.2	96.1	96.4	14.966	-170.3
18	50	.6516	0.0000	.3051	.6952	.6461	.5028	96.3	96.3	96.3	15.507	6.2
18	51	.7613	0.0000	.3570	.5121	.2860	.0000	96.1	95.9	-85.5	41.292	6.1
		0.0000	0.0000	0.0000	GAP 10			GAP 10			55.782	20.9
19	52	-.0264	0.0000	-.0123	.0983	.2505	.3638	-74.4	-71.6	-71.8	43.758	19.2
19	53	-.0792	0.0000	-.0370	.3523	.4345	.4945	-72.2	-72.6	-73.0	23.450	14.9
19	54	-.1320	0.0000	-.0616	.4930	.5301	.5447	-73.1	-73.5	-73.7	8.557	11.3
20	55	-.2126	0.0000	-.0993	.5435	.5027	.3759	-73.8	-73.8	-72.6	13.719	-166.4
21	56	-.3219	0.0000	-.1503	.3737	.1789	.0726	-72.7	-66.4	67.1	34.770	-169.0
21	57	-.4320	0.0000	-.2016	.0748	.3026	.5042	67.6	92.5	95.3	35.391	-170.1
22	58	-.5419	0.0000	-.2532	.5066	.6430	.6919	95.2	96.1	96.4	14.966	-170.3
22	59	-.6516	0.0000	-.3051	.6952	.6461	.5028	96.3	96.3	96.3	15.507	6.2
22	60	-.7613	0.0000	-.3570	.5121	.2860	.0000	96.1	95.9	-85.5	41.292	6.1

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	105.983	-393.585	.000638	.002369	0.000	0.000	105.983	-393.585	1000.000	0.0
2	105.983	-393.585	.000638	.002369	0.000	0.000	105.983	-393.585	1000.000	0.0
3					INFINITE	INFINITE	-92.658	26.082	114.035	58.0
6					INFINITE	INFINITE	-92.658	26.082	114.035	58.0
9					INFINITE	INFINITE	-.000	7578.807	745.235	15.6
10					INFINITE	INFINITE	-.000	7578.807	745.235	15.6
4					INFINITE	INFINITE	-600.000	.000	171.141	50.4
7					INFINITE	INFINITE	-600.000	-.000	171.141	50.4

INPUT POWER = 1275.814 WATTS
RADIATED POWER = 560.394 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 715.421 WATTS
RADIATION EFFICIENCY = 43.92 PER CENT

WIRE COORDINATES IN FEET AND WIRE RADII IN INCHES

WIRE NO		X1	Y1	Z1	RAD1		X2	Y2	Z2	RAD2	INTERVALS
1	GAP 1	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	61.5000	.250000	3
2	GAP 2	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	-61.5000	.250000	3
3	GAP 3	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	30.8000	.250000	3
4		-0.0000	53.2000	30.8000	.250000		-0.0000	89.6000	51.8000	.250000	2
5		-0.0000	89.6000	51.8000	.250000		-0.0000	163.7000	94.5000	.250000	3
6		-0.0000	163.7000	94.5000	.250000		-0.0000	325.9000	188.3000	.250000	5
7		-0.0000	325.9000	188.3000	.250000	GAP 4	-0.0000	488.4000	282.0000	.250000	5
8	GAP 5	-0.0000	488.4000	282.0000	.250000		-0.0000	650.8000	375.7000	.250000	5
9	GAP 6	0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	-30.8000	.250000	3
10		0.0000	53.2000	-30.8000	.250000		-0.0000	89.6000	-51.8000	.250000	2
11		0.0000	89.6000	-51.8000	.250000		-0.0000	163.7000	-94.5000	.250000	3
12		0.0000	163.7000	-94.5000	.250000		-0.0000	325.9000	-188.3000	.250000	5
13		-0.0000	325.9000	-188.3000	.250000	GAP 7	-0.0000	488.4000	-282.0000	.250000	5
14	GAP 8	-0.0000	488.4000	-282.0000	.250000		-0.0000	650.8000	-375.7000	.250000	5
15	GAP 9	-0.0000	-0.0000	-0.0000	.290000		55.7000	-0.0000	26.0000	.290000	3
16		55.7000	-0.0000	26.0000	.290000		93.8000	-0.0000	43.8000	.290000	2
17		93.8000	-0.0000	43.8000	.290000		171.2000	-0.0000	79.9000	.290000	3
18		171.2000	-0.0000	79.9000	.290000		286.9000	-0.0000	134.6000	.290000	4
19	GAP 10	-0.0000	-0.0000	-0.0000	.290000		-55.7000	-0.0000	-26.0000	.290000	3
20		-55.7000	-0.0000	-26.0000	.290000		-93.8000	-0.0000	-43.8000	.290000	2
21		-93.8000	-0.0000	-43.8000	.290000		-171.2000	-0.0000	-79.9000	.290000	3
22		-171.2000	-0.0000	-79.9000	.290000		-286.9000	-0.0000	-134.6000	.290000	4

FREQUENCY = 3.9300 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 383

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 8.1 PER CENT FOR GAPS 4 AND 1

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	60.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	60.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000

COORDINATES — CURRENT DISTRIBUTION — NORMAL ELECTRIC FIELD * RADIUS

WIRE NO	INT NO	X WAVELENGTHS	Y WAVELENGTHS	Z WAVELENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			201.462	-1.7
1	1	0.0000	0.0000	.0409	29.3688	28.3835	25.6033	2.4	1.0	-.0	465.627	-71.3
1	2	0.0000	0.0000	.1228	25.6628	21.1982	15.2790	.1	-.7	-1.3	1226.224	-87.8
1	3	0.0000	0.0000	.2046	15.5146	8.2910	.0000	-1.3	-1.9	-5.0	1830.070	-91.3
		0.0000	0.0000	0.0000	GAP 2			GAP 2			201.462	178.3
2	4	0.0000	0.0000	-.0409	29.3688	28.3835	25.6033	-177.6	-179.0	180.0	465.627	108.7
2	5	0.0000	0.0000	-.1228	25.6628	21.1982	15.2790	-179.9	179.3	178.7	1226.224	92.2
2	6	0.0000	0.0000	-.2046	15.5146	8.2910	.0000	178.7	178.1	175.0	1830.070	88.7
		0.0000	0.0000	0.0000	GAP 3			GAP 3			25.879	37.9
3	7	0.0000	.0354	-.0205	1.6564	1.6268	1.6159	-163.0	-161.4	-163.9	5.707	139.6
3	8	0.0000	.1062	.0615	1.6437	1.6390	1.6382	-164.3	-170.3	-179.0	49.532	-172.4
3	9	0.0000	.1770	.1025	1.6574	1.6728	1.7107	-179.1	170.2	158.3	77.900	174.1
4	10	0.0000	.2488	.1439	1.7283	1.7896	1.8628	158.4	145.9	133.5	90.399	155.6
4	11	0.0000	.3214	.1859	1.8754	1.9458	1.9999	133.6	121.7	109.9	92.712	130.5
5	12	0.0000	.4071	.2352	2.0124	2.0429	2.0181	110.1	94.4	78.1	95.486	94.4
5	13	0.0000	.5057	.2921	2.0301	1.9614	1.8857	78.3	60.7	41.0	107.994	53.4
5	14	0.0000	.6043	.3489	1.8934	1.8489	1.8672	41.3	19.9	-2.1	118.992	18.6
6	15	0.0000	.7184	.4148	1.8738	1.9730	2.0861	-1.7	-29.0	-53.4	114.994	-21.2
6	16	0.0000	.8479	.4897	2.0906	2.1233	2.0526	-53.0	-75.5	-98.3	105.723	-76.9
6	17	0.0000	.9775	.5646	2.0550	1.9131	1.8040	-97.9	-123.1	-151.9	117.054	-132.2
6	18	0.0000	1.1070	.6395	1.8021	1.8031	1.9062	-151.6	178.1	150.0	120.086	-177.9
6	19	0.0000	1.2365	.7144	1.9022	2.0009	2.0104	150.2	125.5	102.7	104.415	130.1
7	20	0.0000	1.3662	.7893	2.0081	1.9022	1.7447	102.9	79.4	52.5	106.877	69.2
7	21	0.0000	1.4959	.8641	1.7410	1.6461	1.7013	52.8	21.7	-10.0	118.635	20.3
7	22	0.0000	1.6257	.9389	1.6941	1.8440	1.9598	-10.0	-37.7	-61.2	105.653	-26.9
7	23	0.0000	1.7555	1.0138	1.9598	1.9452	1.7865	-61.3	-82.9	-106.0	94.926	-90.1
7	24	0.0000	1.8852	1.0886	1.8207	1.5733	1.4586	-105.7	-134.3	-172.7	121.412	-148.7
		0.0000	1.9501	1.1260			GAP 4			GAP 4	133.790	-169.7
		0.0000	1.9501	1.1260	GAP 5			GAP 5			14.483	-39.2
8	25	0.0000	2.0150	1.1634	1.4586	1.3677	.9535	-172.7	-171.0	-172.4	33.440	96.7
8	26	0.0000	2.1447	1.2382	.9482	.3235	.4430	-174.4	169.3	28.1	90.543	102.7
8	27	0.0000	2.2743	1.3131	.4467	1.0774	1.4927	28.0	17.4	14.4	70.399	98.8
8	28	0.0000	2.4040	1.3879	1.4991	1.5947	1.3415	14.2	12.6	11.5	11.339	-54.1
8	29	0.0000	2.5337	1.4627	1.3666	.7939	.0000	11.3	10.3	-176.2	90.460	-78.7
		0.0000	0.0000	0.0000	GAP 6			GAP 6			25.879	-142.1
9	30	0.0000	.0354	-.0205	1.6564	1.6268	1.6159	17.0	18.6	16.1	5.707	-40.4
9	31	0.0000	.1062	-.0615	1.6437	1.6390	1.6382	15.7	9.7	1.0	49.532	7.6
9	32	0.0000	.1770	-.1025	1.6574	1.6728	1.7107	.9	-9.8	-21.7	77.900	-5.9
10	33	0.0000	.2488	-.1439	1.7283	1.7896	1.8628	-21.6	-34.1	-46.5	90.399	-24.4
10	34	0.0000	.3214	-.1859	1.8754	1.9458	1.9999	-46.4	-58.3	-70.1	92.712	-49.5
11	35	0.0000	.4071	-.2352	2.0124	2.0429	2.0181	-69.9	-85.6	-101.9	95.486	-85.6
11	36	0.0000	.5057	-.2921	2.0301	1.9614	1.8857	-101.7	-119.3	-139.0	107.994	-126.6
11	37	0.0000	.6043	-.3489	1.8934	1.8489	1.8672	-138.7	-160.1	177.9	118.992	-161.4
12	38	0.0000	.7184	-.4148	1.8738	1.9730	2.0861	178.3	151.0	126.6	114.994	158.8
12	39	0.0000	.8479	-.4897	2.0906	2.1233	2.0526	127.0	104.5	81.7	105.723	103.1
12	40	0.0000	.9775	-.5646	2.0550	1.9131	1.8040	82.1	56.9	28.1	117.054	47.8
12	41	0.0000	1.1070	-.6395	1.8021	1.8031	1.9062	28.4	-1.9	-30.0	120.086	2.1

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
12	42	0.0000	1.2365	-.7144	1.9022	2.0009	2.0104	-29.8	-54.5	-77.3	104.415	-49.9
13	43	0.0000	1.3662	-.7893	2.0081	1.9022	1.7447	-77.1	-100.6	-127.5	106.877	-110.8
13	44	0.0000	1.4959	-.8641	1.7410	1.6461	1.7013	-127.2	-158.3	170.0	118.635	-159.7
13	45	0.0000	1.6257	-.9389	1.6941	1.8440	1.9598	170.0	142.3	118.8	105.653	153.1
13	46	0.0000	1.7555	-1.0138	1.9598	1.9452	1.7865	118.7	97.1	74.0	94.926	89.9
13	47	0.0000	1.8852	-1.0886	1.8207	1.5733	1.4586	74.3	45.7	7.3	121.412	31.3
		0.0000	1.9501	-1.1260			GAP 7			GAP 7	133.790	10.3
		0.0000	1.9501	-1.1260	GAP 8			GAP 8			14.483	140.8
14	48	0.0000	2.0150	-1.1634	1.4586	1.3677	.9535	7.3	9.0	7.6	33.440	-83.3
14	49	0.0000	2.1447	-1.2382	.9482	.3235	.4430	5.6	-10.7	-151.9	90.543	-77.3
14	50	0.0000	2.2743	-1.3131	.4467	1.0774	1.4927	-152.0	-162.6	-165.6	70.399	-81.2
14	51	0.0000	2.4040	-1.3879	1.4991	1.5947	1.3415	-165.8	-167.4	-168.5	11.339	125.9
14	52	0.0000	2.5337	-1.4627	1.3666	.7939	.0000	-168.7	-169.7	3.8	90.460	101.3
		0.0000	0.0000	0.0000	GAP 9			GAP 9			19.111	129.5
15	53	.0371	0.0000	.0173	7.5097	7.2344	6.5869	-151.8	-152.2	-153.4	111.113	128.9
15	54	.1112	0.0000	.0519	6.6093	5.6149	4.3302	-153.3	-155.5	-159.7	277.859	128.4
15	55	.1853	0.0000	.0865	4.3450	2.8825	1.5383	-159.7	-169.1	161.2	389.090	127.4
16	56	.2604	0.0000	.1216	1.5513	1.5696	2.9442	161.3	90.2	61.0	410.283	125.7
16	57	.3365	0.0000	.1571	2.9417	4.3937	5.6214	61.2	51.6	46.9	329.422	122.3
17	58	.4260	0.0000	.1989	5.6198	6.7121	7.0095	47.0	43.3	40.7	133.309	107.2
17	59	.5291	0.0000	.2470	7.0130	6.4661	5.1410	40.8	38.4	35.2	168.332	-34.4
17	60	.6321	0.0000	.2950	5.1476	3.2166	1.0666	35.4	29.3	-1.2	372.273	-46.2
18	61	.7413	0.0000	.3463	1.0654	2.0698	4.4398	-.4	-119.7	-131.5	399.499	-50.4
18	62	.8568	0.0000	.4009	4.4357	6.1697	6.9493	-131.6	-135.2	-137.1	197.191	-56.5
18	63	.9723	0.0000	.4555	6.9649	6.6418	5.2477	-137.1	-138.4	-139.3	133.070	139.6
18	64	1.0878	0.0000	.5101	5.3391	3.0021	.0000	-139.4	-140.2	-141.9	410.016	130.6
		0.0000	0.0000	0.0000	GAP 10			GAP 10			19.111	-50.5
19	65	-.0371	0.0000	-.0173	7.5097	7.2344	6.5869	28.2	27.8	26.6	111.113	-51.1
19	66	-.1112	0.0000	-.0519	6.6093	5.6149	4.3302	26.7	24.5	20.3	277.859	-51.6
19	67	-.1853	0.0000	-.0865	4.3450	2.8825	1.5383	20.3	10.9	-18.8	389.090	-52.6
20	68	-.2604	0.0000	-.1216	1.5513	1.5696	2.9442	-18.7	-89.8	-119.0	410.283	-54.3
20	69	-.3365	0.0000	-.1571	2.9417	4.3937	5.6214	-118.8	-128.4	-133.1	329.422	-57.7
21	70	-.4260	0.0000	-.1989	5.6198	6.7121	7.0095	-133.0	-136.7	-139.3	133.309	-72.8
21	71	-.5291	0.0000	-.2470	7.0130	6.4661	5.1410	-139.2	-141.6	-144.8	168.332	145.6
21	72	-.6321	0.0000	-.2950	5.1476	3.2166	1.0666	-144.6	-150.7	178.8	372.273	133.8
22	73	-.7413	0.0000	-.3463	1.0654	2.0698	4.4398	179.6	60.3	48.5	399.499	129.6
22	74	-.8568	0.0000	-.4009	4.4357	6.1697	6.9493	48.4	44.8	42.9	197.191	123.5
22	75	-.9723	0.0000	-.4555	6.9649	6.6418	5.2477	42.9	41.6	40.7	133.070	-40.4
22	76	-1.0878	0.0000	-.5101	5.3391	3.0021	.0000	40.6	39.8	38.1	410.016	-49.4

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	34.019	-1.445	.029342	.001246	0.000	0.000	34.019	-1.445	1000.000	0.0

	OHMS	OHMS	MHOS	MHOS	OHMS	OHMS	OHMS	OHMS	VOLT	DEGREES
2	34.019	-1.445	.029342	.001246	0.000	0.000	34.019	-1.445	1000.000	-180.0
3					INFINITE	INFINITE	-86.498	34.174	154.052	-4.5
6					INFINITE	INFINITE	-86.498	34.174	154.052	175.5
9					INFINITE	INFINITE	-.000	.000	.000	-82.7
10					INFINITE	INFINITE	-.000	-.000	.000	-82.7
4					INFINITE	INFINITE	-600.000	-.000	875.180	-172.7
7					INFINITE	INFINITE	-600.000	-.000	875.180	7.3

INPUT POWER = 58684.644 WATTS
RADIATED POWER = 52629.099 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 6055.545 WATTS
RADIATION EFFICIENCY = 89.68 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

		COORDINATES			CURRENT DISTRIBUTION						NORMAL ELECTRIC FIELD * RADIUS	
		X	Y	Z	AMPLITUDE			PHASE				
WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			74.581	-10.1
1	1	0.0000	0.0000	.0409	4.2107	3.9664	3.5221	16.5	13.3	11.3	91.338	-48.8
1	2	0.0000	0.0000	.1228	3.5419	2.8964	2.0710	11.9	10.9	10.0	173.850	-75.3
1	3	0.0000	0.0000	.2046	2.1058	1.1189	.0000	10.2	9.6	6.1	248.400	-79.8
		0.0000	0.0000	0.0000	GAP 2			GAP 2			74.581	-10.1
2	4	0.0000	0.0000	-.0409	4.2107	3.9664	3.5221	16.5	13.3	11.3	91.338	-48.8

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
2	5	0.0000	0.0000	-.1228	3.5419	2.8964	2.0710	11.9	10.9	10.0	173.850	-75.3
2	6	0.0000	0.0000	-.2046	2.1058	1.1189	.0000	10.2	9.6	6.1	248.400	-79.8
		0.0000	0.0000	0.0000	GAP 3			GAP 3			101.455	-173.6
3	7	0.0000	.0354	.0205	2.0924	2.0284	1.9599	-166.0	-178.2	168.9	104.939	173.1
3	8	0.0000	.1062	.0615	1.9660	1.8969	1.8394	169.2	155.5	140.7	111.251	147.5
3	9	0.0000	.1770	.1025	1.8420	1.8067	1.7994	140.8	125.4	109.8	115.142	122.9
4	10	0.0000	.2488	.1439	1.8006	1.8188	1.8536	109.8	94.1	78.9	112.459	97.4
4	11	0.0000	.3214	.1859	1.8537	1.8908	1.9179	79.0	64.5	50.8	106.016	68.7
5	12	0.0000	.4071	.2352	1.9174	1.9203	1.8792	50.8	32.7	14.5	101.594	30.9
5	13	0.0000	.5057	.2921	1.8780	1.8026	1.7223	14.6	-4.7	-25.4	106.256	-12.2
5	14	0.0000	.6043	.3489	1.7207	1.6684	1.6677	-25.3	-47.6	-70.4	111.341	-50.0
6	15	0.0000	.7184	.4148	1.6649	1.7290	1.8048	-70.3	-98.9	-124.6	105.248	-93.0
6	16	0.0000	.8479	.4897	1.8012	1.8180	1.7555	-124.6	-148.7	-173.1	96.738	-150.5
6	17	0.0000	.9775	.5646	1.7529	1.6477	1.5800	-173.0	160.2	130.5	104.964	153.2
6	18	0.0000	1.1070	.6395	1.5766	1.6028	1.6981	130.6	100.1	72.1	106.127	105.1
6	19	0.0000	1.2365	.7144	1.6952	1.7768	1.7804	72.1	47.2	23.7	94.496	51.0
7	20	0.0000	1.3662	.7893	1.7794	1.6971	1.5852	23.7	-.8	-28.3	98.306	-9.0
7	21	0.0000	1.4959	.8641	1.5831	1.5319	1.5908	-28.2	-58.9	-89.4	106.914	-58.6
7	22	0.0000	1.6257	.9389	1.5860	1.7040	1.7822	-89.4	-116.5	-140.2	96.198	-107.8
7	23	0.0000	1.7555	1.0138	1.7834	1.7548	1.6153	-140.4	-162.8	173.0	89.551	-170.2
7	24	0.0000	1.8852	1.0886	1.6493	1.4482	1.3679	173.2	143.9	105.9	111.742	131.6
		0.0000	1.9501	1.1260			GAP 4			GAP 4	122.675	109.8
		0.0000	1.9501	1.1260	GAP 5			GAP 5			17.787	-118.4
8	25	0.0000	2.0150	1.1634	1.3679	1.2987	.9136	105.9	108.7	108.9	30.315	10.0
8	26	0.0000	2.1447	1.2382	.9061	.3004	.4083	106.8	97.5	-60.5	86.542	20.7
8	27	0.0000	2.2743	1.3131	.4140	1.0340	1.4441	-60.4	-66.8	-68.7	68.581	18.1
8	28	0.0000	2.4040	1.3879	1.4529	1.5527	1.3111	-68.9	69.9	-70.7	9.862	-142.0
8	29	0.0000	2.5337	1.4627	1.3380	.7802	.0000	-71.0	-71.8	103.1	88.562	-161.0
		0.0000	0.0000	0.0000	GAP 6			GAP 6			101.455	-173.6
9	30	0.0000	.0354	-.0205	2.0924	2.0284	1.9599	-166.0	-178.2	168.9	104.939	173.1
9	31	0.0000	.1062	-.0615	1.9660	1.8969	1.8394	169.2	155.5	140.7	111.251	147.5
9	32	0.0000	.1770	-.1025	1.8420	1.8067	1.7994	140.8	125.4	109.8	115.142	122.9
10	33	0.0000	.2488	-.1439	1.8006	1.8188	1.8536	109.8	94.1	78.9	112.459	97.4
10	34	0.0000	.3214	-.1859	1.8537	1.8908	1.9179	79.0	64.5	50.8	106.016	68.7
11	35	0.0000	.4071	-.2352	1.9174	1.9203	1.8792	50.8	32.7	14.5	101.594	30.9
11	36	0.0000	.5057	-.2921	1.8780	1.8026	1.7223	14.6	-4.7	-25.4	106.256	-12.2
11	37	0.0000	.6043	-.3489	1.7207	1.6684	1.6677	-25.3	-47.6	-70.4	111.341	-50.0
12	38	0.0000	.7184	-.4148	1.6649	1.7290	1.8048	-70.3	-98.9	-124.6	105.248	-93.0
12	39	0.0000	.8479	-.4897	1.8012	1.8180	1.7555	-124.6	-148.7	-173.1	96.738	-150.5
12	40	0.0000	.9775	-.5646	1.7529	1.6477	1.5800	-173.0	160.2	130.5	104.964	153.2
12	41	0.0000	1.1070	-.6395	1.5766	1.6028	1.6981	130.6	100.1	72.1	106.127	105.1
12	42	0.0000	1.2365	-.7144	1.6952	1.7768	1.7804	72.1	47.2	23.7	94.496	51.0
13	43	0.0000	1.3662	-.7893	1.7794	1.6971	1.5852	23.7	-.8	-28.3	98.306	-9.0
13	44	0.0000	1.4959	-.8641	1.5831	1.5319	1.5908	-28.2	-58.9	-89.4	106.914	-58.6
13	45	0.0000	1.6257	-.9389	1.5860	1.7040	1.7822	-89.4	-116.5	-140.2	96.198	-107.8
13	46	0.0000	1.7555	-1.0138	1.7834	1.7548	1.6153	-140.4	-162.8	173.0	89.551	-170.2
13	47	0.0000	1.8852	-1.0886	1.6493	1.4482	1.3679	173.2	143.9	105.9	111.742	131.6
		0.0000	1.9501	-1.1260	GAP 7			GAP 7	GAP 1		GAP 7	122.675	109.8
		0.0000	1.9501	-1.1260	GAP 8	1.2966	1.2987	GAP 8	108.7	108.9	17.787	-118.4
14	48	0.0000	2.0150	-1.1634	1.3679	1.2987	.9136	105.9	108.7	108.9	30.315	-10.0
14	49	0.0000	2.1447	-1.2382	.9061	.3004	.4083	106.8	97.5	-60.5	86.542	-20.7
14	50	0.0000	2.2743	-1.3131	.4140	1.0340	1.4441	-60.4	-66.8	-68.7	68.581	18.1

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE			PHASE			VOLTS	DEG
14	51	0.0000	2.4040	-1.3879	1.4529	1.5527	1.3111	-68.9	-69.9	-70.7	9.862	-142.0
14	52	0.0000	2.5337	-1.4627	1.3380	.7802	.0000	-71.0	-71.8	103.1	88.562	-161.0
		0.0000	0.0000	0.0000	GAP 9			GAP 9			69.921	-15.1
15	53	.0371	0.0000	.0173	.1858	.4176	.5081	-82.7	-78.4	-77.9	38.159	14.9
15	54	.1112	0.0000	.0519	.4645	.4506	.3770	-78.3	-78.4	-78.6	10.329	-167.4
15	55	.1853	0.0000	.0865	.3687	.2484	.0976	-78.8	-79.1	-78.8	31.986	-168.8
16	56	.2604	0.0000	.1216	.0939	.0784	.2528	-79.2	98.8	98.8	39.890	-170.6
16	57	.3365	0.0000	.1571	.2549	.4174	.5544	98.8	98.4	97.9	34.466	-172.9
17	58	.4260	0.0000	.1989	.5564	.6831	.7250	97.8	97.0	96.1	14.560	-179.4
17	59	.5291	0.0000	.2470	.7267	.6771	.5407	96.0	94.9	93.1	16.195	14.4
17	60	.6321	0.0000	.2950	.5415	.3355	.0927	93.1	89.3	66.0	39.556	8.3
18	61	.7413	0.0000	.3463	.0927	.2234	.4881	66.1	-71.6	-79.0	43.514	5.6
18	62	.8568	0.0000	.4009	.4890	.6820	.7697	-79.1	-81.4	-82.7	21.751	1.2
18	63	.9723	0.0000	.4555	.7723	.7379	.5839	-82.8	-83.7	-84.4	14.538	-167.8
18	64	1.0878	0.0000	.5101	.5945	.3349	.0000	-84.5	-85.2	-86.5	45.656	-174.5
		0.0000	0.0000	0.0000	GAP 10			GAP 10			69.921	15.1
19	65	-.0371	0.0000	-.0173	.1858	.4176	.5081	-82.7	-78.4	-77.9	38.159	14.9
19	66	-.1112	0.0000	-.0519	.4645	.4506	.3770	-78.3	-78.4	-78.6	10.329	-167.4
19	67	-.1853	0.0000	-.0865	.3687	.2484	.0976	-78.8	-79.1	-78.8	31.986	-168.8
20	68	-.2604	0.0000	-.1216	.0939	.0784	.2528	-79.2	98.8	98.8	39.890	-170.6
20	69	-.3365	0.0000	-.1571	.2549	.4174	.5544	98.8	98.4	97.9	34.466	-172.9
21	70	-.4260	0.0000	-.1989	.5564	.6831	.7250	97.8	97.0	96.1	14.560	-179.4
21	71	-.5291	0.0000	-.2470	.7267	.6771	.5407	96.0	94.9	93.1	16.195	14.4
21	72	-.6321	0.0000	-.2950	.5415	.3355	.0927	93.1	89.3	66.0	39.556	8.3
22	73	-.7413	0.0000	-.3463	.0927	.2234	.4881	66.1	-71.6	-79.0	43.514	5.6
22	74	-.8568	0.0000	-.4009	.4890	.6820	.7697	-79.1	-81.4	-82.7	21.751	1.2
22	75	-.9723	0.0000	-.4555	.7723	.7379	.5839	-82.8	-83.7	-84.4	14.538	-167.8
22	76	-1.0878	0.0000	-.5101	.5945	.3349	.0000	-84.5	-85.2	-86.5	45.656	-174.5

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	DEGREES
1	227.680	-67.557	.004037	.001198	0.000	0.000	227.680	-67.557	1000.000	0.0
2	227.680	-67.557	.004037	.001198	0.000	0.000	227.680	-67.557	1000.000	0.0
3					INFINITE	INFINITE	-86.498	34.174	194.607	-7.5
6					INFINITE	INFINITE	-86.498	34.174	194.607	-7.5
9					INFINITE	INFINITE	-.000	5399.659	1003.199	7.3
10					INFINITE	INFINITE	-.000	5399.659	1003.199	7.3
4					INFINITE	INFINITE	-600.000	.000	820.722	105.9
7					INFINITE	INFINITE	-600.000	.000	820.722	105.9

INPUT POWER = 8073.463 WATTS
RADIATED POWER = 2068.028 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 6005.435 WATTS
RADIATION EFFICIENCY = 25.62 PER CENT

WIRE COORDINATES IN FEET AND WIRE RADII IN INCHES

WIRE NO		X1	Y1	Z1	RAD1		X2	Y2	Z2	RAD2	INTERVALS
1	GAP 1	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	61.5000	.250000	3
2	GAP 2	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	-61.5000	.250000	3
3	GAP 3	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	30.8000	.250000	3
4		-0.0000	53.2000	30.8000	.250000		-0.0000	89.6000	51.8000	.250000	2
5		-0.0000	89.6000	51.8000	.250000		-0.0000	163.7000	94.5000	.250000	3
6		-0.0000	163.7000	94.5000	.250000		-0.0000	325.9000	188.3000	.250000	6
7		-0.0000	325.9000	188.3000	.250000	GAP 4	-0.0000	488.4000	282.0000	.250000	6
8	GAP 5	-0.0000	488.4000	282.0000	.250000		-0.0000	650.8000	375.7000	.250000	6
9	GAP 6	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	-30.8000	.250000	3
10		-0.0000	53.2000	-30.8000	.250000		-0.0000	89.6000	-51.8000	.250000	2
11		-0.0000	89.6000	-51.8000	.250000		-0.0000	163.7000	-94.5000	.250000	3
12		-0.0000	163.7000	-94.5000	.250000		-0.0000	325.9000	-188.3000	.250000	6
13		-0.0000	325.9000	-188.3000	.250000	GAP 7	-0.0000	488.4000	-282.0000	.250000	6
14	GAP 8	-0.0000	488.4000	-282.0000	.250000		-0.0000	650.8000	-375.7000	.250000	6
15	GAP 9	-0.0000	-0.0000	-0.0000	.290000		55.7000	-0.0000	26.0000	.290000	3
16		55.7000	-0.0000	26.0000	.290000		93.8000	-0.0000	43.8000	.290000	2
17		93.8000	-0.0000	43.8000	.290000		171.2000	-0.0000	79.9000	.290000	3
18		171.2000	-0.0000	79.9000	.290000		286.9000	-0.0000	134.6000	.290000	4
19	GAP 10	-0.0000	-0.0000	-0.0000	.290000		-55.7000	-0.0000	-26.0000	.290000	3
20		-55.7000	-0.0000	-26.0000	.290000		-93.8000	-0.0000	-43.8000	.290000	2
21		-93.8000	-0.0000	-43.8000	.290000		-171.2000	-0.0000	-79.9000	.290000	3
22		-171.2000	-0.0000	-79.9000	.290000		-286.9000	-0.0000	-134.6000	.290000	4

FREQUENCY = 4.7000 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 386

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 24.3 PER CENT FOR GAPS 4 AND

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000

		COORDINATES			CURRENT DISTRIBUTION						NORMAL ELECTRIC FIELD * RADIUS	
		X	Y	Z	AMPLITUDE			PHASE				
WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1			188.553	-1.9
1	1	0.0000	0.0000	.0489	5.9807	6.5285	6.3546	-69.2	-71.9	-73.6	59.557	-32.9
1	2	0.0000	0.0000	.1468	6.3124	5.4663	4.0671	-73.4	-74.5	-75.3	223.181	-159.8
1	3	0.0000	0.0000	.2447	4.1250	2.2445	.0000	-75.3	-76.0	96.7	408.809	-165.3
		0.0000	0.0000	.0000	GAP 2			GAP 2			188.553	178.1
2	4	0.0000	0.0000	-.0489	5.9807	6.5285	6.3546	110.8	108.1	106.4	59.557	147.1
2	5	0.0000	0.0000	-.1468	6.3124	5.4663	4.0671	106.6	105.5	104.7	223.181	20.2
2	6	0.0000	0.0000	-.2447	4.1250	2.2445	.0000	104.7	104.0	-83.3	408.809	14.7
		0.0000	-.0000	-.0000	GAP 3			GAP 3			15.773	-175.2
3	7	0.0000	.0423	.0245	.0426	.1100	.2142	15.8	68.8	76.7	19.540	177.6
3	8	0.0000	.1270	.0735	.2125	.3267	.4407	76.7	77.9	77.3	22.629	167.8
3	9	0.0000	.2117	.1226	.4454	.5440	.6139	77.4	76.0	74.0	17.001	154.9
4	10	0.0000	.2975	.1721	.6193	.6498	.6316	74.0	71.3	67.6	6.881	80.8
4	11	0.0000	.3844	.2223	.6360	.5690	.4602	67.6	62.3	53.8	21.170	7.8
5	12	0.0000	.4868	.2813	.4649	.2932	.2463	53.7	28.1	-31.9	36.829	-7.4
5	13	0.0000	.6048	.3493	.2497	.4046	.5752	-31.0	-70.4	-86.2	34.628	-21.6
5	14	0.0000	.7227	.4173	.5768	.6750	.6725	-85.9	-95.2	-103.3	15.264	-67.9
6	15	0.0000	.8462	.4886	.6749	.5554	.3562	-103.1	-113.9	-135.2	27.793	-166.2

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE			PHASE			VOLTS	DEG
					AMP	AMP	AMP	DEG	DEG	DEG		
6	16	0.0000	.9753	.5632	.3584	.2374	.3942	-134.9	165.9	114.2	41.207	171.5
6	17	0.0000	1.1044	.6379	.3938	.5900	.6952	114.5	96.0	85.7	26.447	147.2
6	18	0.0000	1.2335	.7125	.6958	.6729	.5289	85.8	76.8	64.7	18.435	39.0
6	19	0.0000	1.3626	.7872	.5301	.3217	.2538	64.9	38.9	-27.9	39.778	-.1
6	20	0.0000	1.4917	.8618	.2534	.4407	.6241	-27.6	-69.7	-85.4	35.478	-19.0
7	21	0.0000	1.6209	.9365	.6239	.7013	.6467	-85.3	-95.0	-104.2	13.916	-88.6
7	22	0.0000	1.7502	1.0110	.6473	.4768	.2688	-104.1	-117.6	-151.8	33.661	-171.0
7	23	0.0000	1.8796	1.0856	.2690	.2808	.4936	-151.5	136.0	104.7	40.872	169.6
7	24	0.0000	2.0089	1.1602	.4925	.6585	.7057	104.7	91.9	83.2	20.312	137.2
7	25	0.0000	2.1382	1.2347	.7058	.6189	.4231	83.1	74.1	59.5	23.924	21.2
7	26	0.0000	2.2675	1.3093	.4293	.2182	.2988	58.9	15.6	-62.6	42.374	-7.6
		0.0000	2.3322	1.3466			GAP 4			GAP 4	41.300	-17.9
		0.0000	2.3322	1.3466	GAP 5			GAP 5			29.772	29.3
8	27	0.0000	2.3968	1.3839	.2988	.4882	.5674	-62.6	-62.5	-63.9	17.845	24.5
8	28	0.0000	2.5261	1.4585	.5669	.5204	.3589	-64.7	-66.8	-70.1	14.090	-145.7
8	29	0.0000	2.6553	1.5330	.3589	.1211	.1619	-70.2	-84.5	128.8	34.171	-154.3
8	30	0.0000	2.7846	1.6076	.1622	.3990	.5546	128.3	118.9	116.3	26.382	-158.5
8	31	0.0000	2.9138	1.6822	.5569	.5934	.5001	116.1	114.7	113.6	4.059	46.7
8	32	0.0000	3.0431	1.7568	.5100	.2969	.0000	113.4	112.5	111.5	33.864	23.4
		0.0000	-.0000	.0000	GAP 6			GAP 6			15.773	4.8
9	33	0.0000	.0423	-.0245	.0426	.1100	.2142	-164.2	-111.2	-103.3	19.540	-2.4
9	34	0.0000	.1270	-.0735	.2125	.3267	.4407	-103.3	-102.1	-102.7	22.629	-12.2
9	35	0.0000	.2117	-.1226	.4454	.5440	.6139	-102.6	-104.0	-106.0	17.001	-25.1
10	36	0.0000	.2975	-.1721	.6193	.6498	.6316	-106.0	-108.7	-112.4	6.881	-99.2
10	37	0.0000	.3844	-.2223	.6360	.5690	.4602	-112.4	-117.7	-126.2	21.170	-172.2
11	38	0.0000	.4868	-.2813	.4649	.2932	.2463	-126.3	-151.9	148.1	36.829	172.6
11	39	0.0000	.6048	-.3493	.2497	.4046	.5752	149.0	109.6	93.8	34.628	158.4
11	40	0.0000	.7227	-.4173	.5768	.6750	.6725	94.1	84.8	76.7	15.264	112.1
12	41	0.0000	.8462	-.4886	.6749	.5554	.3562	76.9	66.1	44.8	27.793	13.8
12	42	0.0000	.9753	-.5632	.3584	.2374	.3942	45.1	-14.1	-65.8	41.207	-8.5
12	43	0.0000	1.1044	-.6379	.3938	.5900	.6952	65.5	-84.0	-94.3	26.447	-32.8
12	44	0.0000	1.2335	-.7125	.6958	.6729	.5289	-94.2	-103.2	-115.3	18.435	-141.0
12	45	0.0000	1.3626	-.7872	.5301	.3217	.2538	-115.1	-141.1	152.1	39.778	179.9
12	46	0.0000	1.4917	-.8618	.2534	.4407	.6241	152.4	110.3	94.6	35.478	161.0
13	47	0.0000	1.6209	-.9365	.6239	.7013	.6467	94.7	85.0	75.8	13.916	91.4
13	48	0.0000	1.7502	-1.0110	.6473	.4768	.2688	75.9	62.4	28.2	33.661	9.0
13	49	0.0000	1.8796	-1.0856	.2690	.2808	.4936	28.5	-44.0	-75.3	40.872	-10.4
13	50	0.0000	2.0089	-1.1602	.4925	.6585	.7057	-75.3	-88.1	-96.8	20.312	-42.8
13	51	0.0000	2.1382	-1.2347	.7058	.6189	.4231	-96.9	-105.9	-120.5	23.924	-158.8
13	52	0.0000	2.2675	-1.3093	.4293	.2182	.2988	-121.1	-164.4	117.4	42.374	172.4
		0.0000	2.3322	-1.3466			GAP 7			GAP 7	41.300	162.1
		0.0000	2.3322	-1.3466	GAP 8			GAP 8			29.772	-150.7
14	53	0.0000	2.3968	-1.3839	.2988	.4882	.5674	117.4	117.5	116.1	17.845	-155.5
14	54	0.0000	2.5261	-1.4585	.5669	.5204	.3589	115.3	113.2	109.9	14.090	34.3
14	55	0.0000	2.6553	-1.5330	.3589	.1211	.1619	109.8	95.5	-51.2	34.171	25.7
14	56	0.0000	2.7846	-1.6076	.1622	.3990	.5546	-51.7	-61.1	-63.7	26.382	21.5
14	57	0.0000	2.9138	-1.6822	.5569	.5934	.5001	-63.9	-65.3	-66.4	4.059	-133.3
14	58	0.0000	3.0431	-1.7568	.5100	.2969	.0000	-66.6	-67.5	-68.5	33.864	-156.6
		0.0000	0.0000	0.0000	GAP 9			GAP 9			9.871	-177.4
15	59	.0443	0.0000	.0207	.4158	.4543	.4764	67.6	70.6	73.7	7.621	-161.3
15	60	.1330	0.0000	.0621	.4748	.4803	.4700	74.0	77.0	79.7	4.757	-97.5
15	61	.2216	0.0000	.1035	.4741	.4446	.3938	79.9	82.2	83.9	8.480	-28.5

WIRE NO	INT NO	X WAVE-LENGTHS	Z WAVE-LENGTHS	WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
16	62	.3115	0.0000	.1454	.3986	.3241	.2291	83.9	84.6	83.4	16.387	-5.4
16	63	.4024	0.0000	.1879	.2329	.1242	.0389	83.3	75.9	1.8	22.276	2.9
17	64	.5095	0.0000	.2379	.0415	.1635	.2941	6.2	-69.1	-75.2	21.058	6.7
17	65	.6327	0.0000	.2953	.2937	.3771	.3980	-74.5	-76.5	-77.6	7.672	3.6
17	66	.7559	0.0000	.3528	.3997	.3523	.2437	-77.3	-78.5	-80.9	11.395	-161.6
18	67	.8866	0.0000	.4142	.2464	.0756	.1265	-80.6	-95.7	117.8	23.944	-164.4
18	68	1.0247	0.0000	.4795	.1250	.2945	.4058	118.1	110.4	108.5	18.405	-165.7
18	69	1.1628	0.0000	.5448	.4074	.4323	.3633	108.6	107.7	107.2	2.931	30.2
18	70	1.3009	0.0000	.6101	.3719	.2161	.0000	107.2	106.8	-78.7	24.162	17.2
		0.0000	0.0000	0.0000	GAP 10			GAP 10			9.871	2.6
19	71	-.0443	0.0000	-.0207	.4158	.4543	.4764	-112.4	-109.4	-106.3	7.621	18.7
19	72	-.1330	0.0000	-.0621	.4748	.4803	.4700	-106.0	-103.0	-100.3	4.757	82.5
19	73	-.2216	0.0000	-.1035	.4741	.4446	.3938	-100.1	-97.8	-96.1	8.480	151.5
20	74	-.3115	0.0000	-.1454	.3986	.3241	.2291	-96.1	-95.4	-96.6	16.387	174.6
20	75	-.4024	0.0000	-.1879	.2329	.1242	.0389	-96.7	-104.1	-178.2	22.276	-177.1
21	76	-.5095	0.0000	-.2379	.0415	.1635	.2941	-173.8	110.9	104.8	21.058	-173.3
21	77	-.6327	0.0000	-.2953	.2937	.3771	.3980	105.5	103.5	102.4	7.672	-176.4
21	78	-.7559	0.0000	-.3528	.3997	.3523	.2437	102.7	101.5	99.1	11.395	18.4
22	79	-.8866	0.0000	-.4142	.2464	.0756	.1265	99.4	84.3	-62.2	23.944	15.6
22	80	-1.0247	0.0000	-.4795	.1250	.2945	.4058	-61.9	-69.6	-71.5	18.405	14.3
22	81	-1.1628	0.0000	-.5448	.4074	.4323	.3633	-71.4	-72.3	-72.8	2.931	-149.8
22	82	-1.3009	0.0000	-.6101	.3719	.2161	.0000	-73.8	-73.2	101.2	24.162	-162.8

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IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	59.402	156.296	.002125	-.005591	0.000	0.000	59.402	156.296	1000.000	0.0
2	59.402	156.296	.002125	-.005591	0.000	0.000	59.402	156.296	1000.000	-180.0
3					INFINITE	INFINITE	-81.749	38.626	3.855	170.5
6					INFINITE	INFINITE	-81.749	38.626	3.855	-9.5
9					INFINITE	INFINITE	.000	.000	.000	126.9
10					INFINITE	INFINITE	-.000	-.000	.000	126.9
4					INFINITE	INFINITE	-600.000	0.000	179.284	-62.6
7					INFINITE	INFINITE	-600.000	.000	179.284	117.4

INPUT POWER = 4249.534 WATTS
RADIATED POWER = 4034.654 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 214.880 WATTS
RADIATION EFFICIENCY = 94.94 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

		COORDINATES			CURRENT DISTRIBUTION						NORMAL ELECTRIC FIELD * RADIUS	
		X	Y	Z	AMPLITUDE			PHASE				
WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1			139.449	8.1
1	1	0.0000	0.0000	.0489	2.9185	2.8678	2.6774	10.2	-1.3	-7.9	90.385	-14.0
1	2	0.0000	0.0000	.1468	2.6846	2.2762	1.6702	-5.7	-9.1	-11.7	102.892	-86.0
1	3	0.0000	0.0000	.2447	1.6980	.9156	.0000	-11.1	-12.8	148.3	168.278	-101.1
		0.0000	0.0000	.0000	GAP 2			GAP 2			139.449	8.1
2	4	0.0000	0.0000	-.0489	2.9185	2.8678	2.6774	10.2	-1.3	-7.9	90.385	-14.0
2	5	0.0000	0.0000	-.1468	2.6846	2.2762	1.6702	-5.7	-9.1	-11.7	102.892	-86.0
2	6	0.0000	0.0000	-.2447	1.6980	.9156	.0000	-11.1	-12.8	148.3	168.278	-101.1
		0.0000	-.0000	-.0000	GAP 3			GAP 3			56.685	160.4
3	7	0.0000	.0423	.0245	1.4395	1.2465	1.0804	-168.2	178.0	153.0	89.457	150.4
3	8	0.0000	.1270	.0735	1.0933	1.1604	1.4391	151.4	120.4	96.5	119.509	138.7
3	9	0.0000	.2117	.1226	1.4471	1.7912	2.0814	96.5	81.3	71.0	98.611	122.2
4	10	0.0000	.2975	.1721	2.0850	2.2567	2.2651	71.1	63.0	55.9	58.285	80.7
4	11	0.0000	.3844	.2223	2.2670	2.1038	1.7880	56.0	48.6	39.7	72.123	8.3
5	12	0.0000	.4868	.2813	1.7896	1.2154	.8148	39.8	19.5	-28.3	120.611	-23.2
5	13	0.0000	.6048	.3493	.8111	1.1009	1.6412	-28.0	-81.3	-104.3	119.319	-42.8
5	14	0.0000	.7227	.4173	1.6364	2.0071	2.0770	-104.3	-116.4	-125.9	59.244	-83.2
6	15	0.0000	.8462	.4886	2.0735	1.7845	1.2206	-125.8	-137.2	-156.5	79.648	175.5
6	16	0.0000	.9753	.5632	1.2180	.7657	1.0981	-156.5	153.5	95.7	124.468	147.4
6	17	0.0000	1.1044	.6379	1.0959	1.6785	2.0256	95.6	73.0	61.2	85.092	122.3
6	18	0.0000	1.2335	.7125	2.0242	1.9992	1.6084	61.2	51.4	39.3	53.234	19.6
6	19	0.0000	1.3626	.7872	1.6073	1.0038	.7387	39.4	14.9	-48.7	116.065	-25.6

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
6	20	0.0000	1.4917	.8618	.7360	1.2517	1.8014	-48.7	-94.7	-111.7	106.713	-45.7
7	21	0.0000	1.6209	.9365	1.8000	2.0507	1.9146	-111.7	-121.9	-131.3	42.562	-111.3
7	22	0.0000	1.7502	1.0110	1.9142	1.4321	.8173	-131.3	-144.6	-176.6	96.949	162.2
7	23	0.0000	1.8796	1.0856	.8162	.7932	1.4020	-176.5	111.1	77.4	119.942	141.7
7	24	0.0000	2.0089	1.1602	1.3992	1.8923	2.0429	77.3	64.0	55.0	61.021	109.5
7	25	0.0000	2.1382	1.2347	2.0423	1.8017	1.2396	54.8	45.6	31.0	68.831	-6.3
7	26	0.0000	2.2675	1.3093	1.2569	.6424	.8653	30.3	-12.5	-91.0	123.426	-36.2
		0.0000	2.3322	1.3466			GAP 4			GAP 4	121.033	-46.8
		0.0000	2.3322	1.3466	GAP 5			GAP 5			86.522	.1
8	27	0.0000	2.3968	1.3839	.8653	1.4153	1.6449	-91.0	-91.4	-93.1	51.845	-5.4
8	28	0.0000	2.5261	1.4585	1.6431	1.5080	1.0405	-93.9	-96.4	-100.2	41.133	-173.3
8	29	0.0000	2.6553	1.5330	1.0396	.3564	.4762	-100.3	-117.1	102.1	98.989	176.7
8	30	0.0000	2.7846	1.6076	.4771	1.1568	1.6033	101.6	90.6	87.6	76.100	171.8
8	31	0.0000	2.9138	1.6822	1.6091	1.7117	1.4403	87.3	85.7	84.5	12.266	20.0
8	32	0.0000	3.0431	1.7568	1.4672	.8528	.0000	84.3	83.3	82.2	97.426	-5.7
		0.0000	-.0000	.0000	GAP 6			GAP 6			56.685	160.4
9	33	0.0000	.0423	-.0245	1.4395	1.2465	1.0804	-168.2	178.0	153.0	89.457	150.4
9	34	0.0000	.1270	-.0735	1.0933	1.1604	1.4391	151.4	120.4	96.5	119.509	138.7
9	35	0.0000	.2117	-.1226	1.4471	1.7912	2.0814	96.5	81.3	71.0	98.611	122.2
10	36	0.0000	.2975	-.1721	2.0850	2.2567	2.2651	71.1	63.0	55.9	58.285	80.7
10	37	0.0000	.3844	-.2223	2.2670	2.1038	1.7880	56.0	48.6	39.7	72.123	8.3
11	38	0.0000	.4868	-.2813	1.7896	1.2154	.8148	39.8	19.5	-28.3	120.611	-23.2
11	39	0.0000	.6048	-.3493	.8111	1.1009	1.6412	-28.0	-81.3	-104.3	119.319	-42.8
11	40	0.0000	.7227	-.4173	1.6364	2.0071	2.0770	-104.3	-116.4	-125.9	59.244	-83.2
12	41	0.0000	.8462	-.4886	2.0735	1.7845	1.2206	-125.8	-137.2	-156.5	79.648	175.5
12	42	0.0000	.9753	-.5632	1.2180	.7657	1.0981	-156.5	153.5	95.7	124.468	147.4
12	43	0.0000	1.1044	-.6379	1.0959	1.6785	2.0256	95.6	73.0	61.2	85.092	122.3
12	44	0.0000	1.2335	-.7125	2.0242	1.9992	1.6084	61.2	51.4	39.3	53.234	19.6
12	45	0.0000	1.3626	-.7872	1.6073	1.0038	.7387	39.4	14.9	-48.7	116.065	-25.6
12	46	0.0000	1.4917	-.8618	.7360	1.2517	1.8014	-48.7	-94.7	-111.7	106.713	-45.7
13	47	0.0000	1.6209	-.9365	1.8000	2.0507	1.9146	-111.7	-121.9	-131.3	42.562	-111.3
13	48	0.0000	1.7502	-1.0110	1.9142	1.4321	.8173	-131.3	-144.6	-176.6	96.949	162.2
13	49	0.0000	1.8796	-1.0856	.8162	.7932	1.4020	-176.5	111.1	77.4	119.942	141.7
13	50	0.0000	2.0089	-1.1602	1.3992	1.8923	2.0429	77.3	64.0	55.0	61.021	109.5
13	51	0.0000	2.1382	-1.2347	2.0423	1.8017	1.2396	54.8	45.6	31.0	68.831	-6.3
13	52	0.0000	2.2675	-1.3093	1.2569	.6424	.8653	30.3	-12.5	-91.0	123.426	-36.2
		0.0000	2.3322	-1.3466			GAP 7			GAP 7	121.033	-46.8
		0.0000	2.3322	-1.3466	GAP 8			GAP 8			86.522	.1
14	53	0.0000	2.3968	-1.3839	.8653	1.4153	1.6449	-91.0	-91.4	-93.1	51.845	-5.4
14	54	0.0000	2.5261	-1.4585	1.6431	1.5080	1.0405	-93.9	-96.4	-100.2	41.133	-173.3
14	55	0.0000	2.6553	-1.5330	1.0396	.3564	.4762	-100.3	-117.1	102.1	98.989	176.7
14	56	0.0000	2.7846	-1.6076	.4771	1.1568	1.6033	101.6	90.6	87.6	76.100	171.8
14	57	0.0000	2.9138	-1.6822	1.6091	1.7117	1.4403	87.3	85.7	84.5	12.266	20.0
14	58	0.0000	3.0431	-1.7568	1.4672	.8528	.0000	84.3	83.3	82.2	97.426	-5.7
		0.0000	0.0000	0.0000	GAP 9			GAP 9			155.432	-169.5
15	59	.0443	0.0000	.0207	.0904	.8758	1.6211	126.9	100.8	96.9	153.030	-174.7
15	60	.1330	0.0000	.0621	1.6236	2.2535	2.7052	96.1	93.8	91.9	108.330	175.6
15	61	.2216	0.0000	.1035	2.7108	2.9370	2.9114	91.8	90.1	88.2	26.620	138.4
16	62	.3115	0.0000	.1454	2.9159	2.6278	2.1015	88.2	85.8	82.1	82.824	13.4
16	63	.4024	0.0000	.1879	2.1050	1.3997	.6478	82.1	74.7	48.9	154.940	4.8
17	64	.5095	0.0000	.2379	.6507	.8570	1.8622	49.1	-58.1	-77.0	167.031	-.1
17	65	.6327	0.0000	.2953	1.8600	2.5937	2.8799	-76.9	-82.6	-85.9	78.401	-11.5

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
17	66	.7559	0.0000	.3528	2.8807	2.6596	1.9698	-85.8	-88.7	-92.5	68.920	-162.0
18	67	.8866	0.0000	.4142	1.9723	.8078	.6618	-92.3	-105.2	116.5	167.125	-175.2
18	68	1.0247	0.0000	.4795	.6560	1.8604	2.6848	115.7	99.5	95.9	135.112	179.7
18	69	1.1628	0.0000	.5448	2.6918	2.9164	2.4786	95.7	93.8	92.6	16.485	37.0
18	70	1.3009	0.0000	.6101	2.5264	1.4756	.0000	92.4	91.4	-101.4	164.138	2.4
		0.0000	0.0000	0.0000	GAP 10			GAP 10			155.432	-169.5
19	71	-.0443	0.0000	-.0207	.0904	.8758	1.6211	126.9	100.8	96.9	153.030	-174.7
19	72	-.1330	0.0000	-.0621	1.6236	2.2535	2.7052	96.1	93.8	91.9	108.330	175.6
19	73	-.2216	0.0000	-.1035	2.7108	2.9370	2.9114	91.8	90.1	88.2	26.620	138.4
20	74	-.3115	0.0000	-.1454	2.9159	2.6278	2.1015	88.2	85.8	82.1	82.824	13.4
20	75	-.4024	0.0000	-.1879	2.1050	1.3997	.6478	82.1	74.7	48.9	154.940	4.8
21	76	-.5095	0.0000	-.2379	.6507	.8570	1.8622	49.1	-58.1	-77.0	167.031	-.1
21	77	-.6327	0.0000	-.2953	1.8600	2.5937	2.8799	-76.9	-82.6	-85.9	78.401	-11.5
21	78	-.7559	0.0000	-.3528	2.8807	2.6596	1.9698	-85.8	-88.7	-92.5	68.920	-162.0
22	79	-.8866	0.0000	-.4142	1.9723	.8078	.6618	-92.3	-105.2	116.5	167.125	-175.2
22	80	-1.0247	0.0000	-.4795	.6560	1.8604	2.6848	115.7	99.5	95.9	135.112	179.7
22	81	-1.1628	0.0000	-.5448	2.6918	2.9164	2.4786	95.7	93.8	92.6	16.485	37.0
22	82	-1.3009	0.0000	-.6101	2.5264	1.4756	.0000	92.4	91.4	-101.4	164.138	2.4

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	DEGREES
1	337.230	-60.633	.002872	.000516	0.000	0.000	-337.230	-60.633	1000.000	0.0
2	337.230	-60.633	.002872	.000516	0.000	0.000	337.230	-60.633	1000.000	0.0
3					INFINITE	INFINITE	-81.749	38.626	130.153	-13.5
6					INFINITE	INFINITE	-81.749	38.626	130.153	-13.5
9					INFINITE	INFINITE	-.000	4515.034	408.255	-143.1
10					INFINITE	INFINITE	.000	4515.034	408.255	-143.1
4					INFINITE	INFINITE	-600.000	-.000	519.195	-91.0
7					INFINITE	INFINITE	-600.000	-.000	519.195	-91.0

INPUT POWER = 5744.945 WATTS
RADIATED POWER = 3270.262 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 2474.683 WATTS
RADIATION EFFICIENCY = 56.92 PER CENT

WIRE COORDINATES IN FEET AND WIRE RADII IN INCHES

WIRE NO		X1	Y1	Z1	RAD1	X2	Y2	Z2	RAD2	INTERVALS
1	GAP 1	-0.0000	-0.0000	-0.0000	.250000	-0.0000	-0.0000	61.5000	.250000	3

WIRE NO		X1	Y1	Z1	RAD1		X2	Y2	Z2	RAD2	INTERVALS
2	GAP 2	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	-61.5000	.250000	3
3	GAP 3	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	30.8000	.250000	3
4		-0.0000	53.2000	30.8000	.250000		-0.0000	89.6000	51.8000	.250000	2
5		-0.0000	89.6000	51.8000	.250000		-0.0000	163.7000	-94.5000	.250000	4
6		-0.0000	163.7000	-94.5000	.250000		-0.0000	325.9000	188.3000	.250000	8
7		-0.0000	325.9000	188.3000	.250000	GAP 4	-0.0000	488.4000	282.0000	.250000	8
8	GAP 5	-0.0000	488.4000	282.0000	.250000		-0.0000	650.8000	375.7000	.250000	8
9	GAP 6	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	-30.8000	.250000	3
10		-0.0000	53.2000	-30.8000	.250000		-0.0000	89.6000	-51.8000	.250000	2
11		-0.0000	89.6000	-51.8000	.250000		-0.0000	163.7000	-94.5000	.250000	4
12		-0.0000	163.7000	-94.5000	.250000		-0.0000	325.9000	-188.3000	.250000	8
13		-0.0000	325.9000	-188.3000	.250000	GAP 7	-0.0000	488.4000	-282.0000	.250000	8
14	GAP 8	-0.0000	488.4000	-282.0000	.250000		-0.0000	650.8000	-375.7000	.250000	8
15	GAP 9	-0.0000	-0.0000	-0.0000	.290000		55.7000	-0.0000	26.0000	.290000	3
16		55.7000	-0.0000	26.0000	.290000		93.8000	-0.0000	43.8000	.290000	2
17		93.8000	-0.0000	43.8000	.290000		171.2000	-0.0000	79.9000	.290000	4
18		171.2000	-0.0000	79.9000	.290000		286.9000	-0.0000	134.6000	.290000	6
19	GAP 10	-0.0000	-0.0000	-0.0000	.290000		-55.7000	-0.0000	-26.0000	.290000	3
20		-55.7000	-0.0000	-26.0000	.290000		-93.8000	-0.0000	-43.8000	.290000	2
21		-93.8000	-0.0000	-43.8000	.290000		-171.2000	-0.0000	-79.9000	.290000	4
22		-171.2000	-0.0000	-79.9000	.290000		-286.9000	-0.0000	-134.6000	.290000	6

FREQUENCY = 6.5500 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 389

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 32.8 PER CENT FOR GAPS 4 AND 1

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000

WIRE NO	INT NO	COORDINATES X WAVELENGTHS	COORDINATES Y WAVELENGTHS	COORDINATES Z WAVELENGTHS	CURRENT DISTRIBUTION AMPLITUDE AMP	AMP	AMP	CURRENT DISTRIBUTION PHASE DEG	DEG	DEG	NORMAL ELECTRIC FIELD * RADIUS VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			187.720	-1.5
1	1	0.0000	0.0000	.0682	1.0282	2.0189	2.5682	-51.1	-73.1	-78.9	124.593	-5.0
1	2	0.0000	0.0000	.2046	2.4846	2.4897	2.0232	-78.2	-81.1	-82.9	35.857	-148.7
1	3	0.0000	0.0000	.3411	2.0474	1.1650	.0000	-82.8	-84.1	-82.3	147.796	-172.8
		0.0000	0.0000	0.0000	GAP 2			GAP 2			187.720	178.5
2	4	0.0000	0.0000	-.0682	1.0282	2.0189	2.5682	128.9	106.9	101.1	124.593	175.0
2	5	0.0000	0.0000	-.2046	2.4846	2.4897	2.0232	101.8	98.9	97.1	35.857	31.3
2	6	0.0000	0.0000	-.3411	2.0474	1.1650	.0000	97.2	95.9	97.7	147.796	7.2
		0.0000	0.0000	0.0000	GAP 3			GAP 3			17.542	-171.1
3	7	0.0000	.0590	.0342	.0975	.1569	.2057	172.0	127.2	104.9	13.740	166.7
3	8	0.0000	.1770	.1025	.1943	.2229	.2465	105.0	84.3	63.8	11.744	101.9
3	9	0.0000	.2950	.1708	.2494	.2690	.2824	63.6	43.7	24.3	13.109	53.8
4	10	0.0000	.4146	.2399	.2865	.2896	.2819	24.5	4.8	-16.1	13.916	2.9
4	11	0.0000	.5357	.3098	.2849	.2705	.2597	-15.8	-38.8	-64.8	16.030	-46.1
5	12	0.0000	.6579	.3802	.2613	.2613	.2735	-64.4	-92.1	-118.8	16.987	-89.1
5	13	0.0000	.7812	.4513	.2743	.2886	.2958	-118.5	-142.6	-165.0	15.692	-136.7
5	14	0.0000	.9045	.5223	.2964	.2915	.2783	-164.8	173.0	149.0	15.717	167.9
5	15	0.0000	1.0278	.5934	.2787	.2660	.2644	149.2	122.6	94.4	17.378	118.9
6	16	0.0000	1.1569	.6679	.2646	.2764	.2920	94.6	64.8	38.1	16.876	71.6
6	17	0.0000	1.2918	.7459	.2921	.2976	.2890	38.3	13.7	-11.3	15.542	12.9
6	18	0.0000	1.4267	.8239	.2890	.2721	.2618	-11.0	-38.4	-68.9	17.071	-45.1
6	19	0.0000	1.5616	.9020	.2616	.2671	.2831	-68.7	-99.8	-128.1	17.250	-94.5
6	20	0.0000	1.6966	.9800	.2828	.2940	.2908	-128.0	-153.3	-177.7	15.390	-151.1
6	21	0.0000	1.8315	1.0580	.2907	.2740	.2567	-177.6	156.4	126.9	16.384	147.9
6	22	0.0000	1.9664	1.1361	.2563	.2531	.2667	127.0	95.0	64.6	17.306	97.7
6	23	0.0000	2.1013	1.2141	.2664	.2829	.2879	64.6	37.8	13.3	15.349	43.6

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
7	24	0.0000	-2.2364	1.2921	.2877	.2764	.2573	13.4	-11.6	-39.7	15.623	-19.5
7	25	0.0000	2.3716	1.3700	.2570	.2470	.2566	-39.6	-71.4	-103.3	17.273	-71.5
7	26	0.0000	2.5067	1.4480	.2562	.2763	.2890	-103.3	-131.5	-156.1	15.557	-122.8
7	27	0.0000	2.6419	1.5259	.2890	.2835	.2627	-156.1	-179.8	154.1	14.888	173.2
7	28	0.0000	2.7771	1.6039	.2626	.2425	.2428	154.2	123.5	89.9	17.174	118.5
7	29	0.0000	2.9123	1.6818	.2419	.2631	.2852	89.9	59.3	33.8	15.977	70.6
7	30	0.0000	3.0474	1.7597	.2855	.2890	.2671	33.6	11.1	-12.3	13.769	6.2
7	31	0.0000	3.1826	1.8377	.2738	.2326	.2107	-12.1	-41.1	-82.3	18.074	-57.7
		0.0000	3.2502	1.8767			GAP 4			GAP 4	20.406	-79.4
		0.0000	3.2502	1.8767	GAP 5			GAP 5			2.863	59.7
8	32	0.0000	3.3178	1.9156	.2107	.1973	.1314	-82.3	-79.1	-79.4	5.085	-177.2
8	33	0.0000	3.4528	1.9936	.1300	.0315	.0852	-82.3	-105.0	113.2	13.600	-166.2
8	34	0.0000	3.5879	2.0715	.0864	.1797	.2332	113.5	107.0	104.4	9.470	-170.9
8	35	0.0000	3.7230	2.1495	.2342	.2338	.1785	104.4	102.3	99.4	3.732	29.9
8	36	0.0000	3.8581	2.2274	.1792	.0823	.0432	99.4	90.7	-49.5	13.859	15.3
8	37	0.0000	3.9932	2.3054	.0430	.1507	.2276	-49.9	-70.1	-73.6	12.049	11.1
8	38	0.0000	4.1283	2.3833	.2286	.2530	.2177	-73.8	-75.5	-76.6	.987	-120.0
8	39	0.0000	4.2634	2.4612	.2224	.1310	.0000	-76.9	-77.8	-76.9	14.179	-166.9
		0.0000	0.0000	0.0000	GAP 6			GAP 6			17.542	8.9
9	40	0.0000	.0590	-.0342	.0975	.1569	.2057	-8.0	-52.8	-75.1	13.740	-13.3
9	41	0.0000	.1770	-.1025	.1943	.2229	.2465	-75.0	-95.7	-116.2	11.744	-78.1
9	42	0.0000	.2950	-.1708	.2494	.2690	.2824	-116.4	-136.3	-155.7	13.109	-126.2
10	43	0.0000	.4146	-.2399	.2865	.2896	.2819	-155.5	-175.2	163.9	13.916	-177.1
10	44	0.0000	.5357	-.3098	.2849	.2705	.2597	164.2	141.2	115.2	16.030	133.9
11	45	0.0000	.6579	-.3802	.2613	.2613	.2735	115.6	87.9	61.2	16.987	90.9
11	46	0.0000	.7812	-.4513	.2743	.2886	.2958	61.5	37.4	15.0	15.692	43.3
11	47	0.0000	.9045	-.5223	.2964	.2915	.2783	15.2	-7.0	-31.0	15.717	-12.1
11	48	0.0000	1.0278	-.5934	.2787	.2660	.2644	-30.8	-57.4	-85.6	17.378	-61.1
12	49	0.0000	1.1569	-.6679	.2646	.2764	.2920	-85.4	-115.2	-141.9	16.876	-108.4
12	50	0.0000	1.2918	-.7459	.2921	.2976	.2890	-141.7	-166.3	168.7	15.542	-167.1
12	51	0.0000	1.4267	-.8239	.2890	.2721	.2618	169.0	141.6	111.1	17.071	134.9
12	52	0.0000	1.5616	-.9020	.2616	.2671	.2831	111.3	80.2	51.9	17.250	85.5
12	53	0.0000	1.6966	-.9800	.2828	.2940	.2908	52.0	26.7	2.3	15.390	28.9
12	54	0.0000	1.8315	-1.0580	.2907	.2740	.2567	2.4	-23.6	-53.1	16.384	-32.1
12	55	0.0000	1.9664	-1.1361	.2563	.2531	.2667	-53.0	-85.0	-115.4	17.306	-82.3
12	56	0.0000	2.1013	-1.2141	.2664	.2829	.2879	-115.4	-142.2	-166.7	15.349	-136.4
13	57	0.0000	2.2364	-1.2921	.2877	.2764	.2573	-166.6	168.4	140.3	15.623	160.5
13	58	0.0000	2.3716	-1.3700	.2570	.2470	.2566	140.4	108.6	76.7	17.273	108.5
13	59	0.0000	2.5067	-1.4480	.2562	.2763	.2890	76.7	48.5	23.9	15.557	57.2
13	60	0.0000	2.6419	-1.5259	.2890	.2835	.2627	23.9	2	-25.9	14.888	-6.8
13	61	0.0000	2.7771	-1.6039	.2626	.2425	.2428	-25.8	-56.5	-90.1	17.174	-61.5
13	62	0.0000	2.9123	-1.6818	.2419	.2631	.2852	-90.1	-120.7	-146.2	15.977	-109.4
13	63	0.0000	3.0474	-1.7597	.2855	.2890	.2671	-146.4	-168.9	167.7	13.769	-173.8
13	64	0.0000	3.1826	-1.8377	.2738	.2326	.2107	167.9	138.9	97.7	18.074	122.3
		0.0000	3.2502	-1.8767			GAP 7			GAP 7	20.406	100.6
		0.0000	3.2502	-1.8767	GAP 8			GAP 8			2.863	-120.3
14	65	0.0000	3.3178	-1.9156	.2107	.1973	.1314	97.7	100.9	100.6	5.085	2.8
14	66	0.0000	3.4528	-1.9936	.1300	.0315	.0852	97.7	75.0	-66.8	13.600	13.8
14	67	0.0000	3.5879	-2.0715	.0864	.1797	.2332	-66.5	-73.0	-75.6	9.470	9.1
14	68	0.0000	3.7230	-2.1495	.2342	.2338	.1785	-75.6	-77.7	-80.6	3.732	-150.1
14	69	0.0000	3.8581	-2.2274	.1792	.0823	.0432	-80.6	-89.3	130.5	13.859	-164.7
14	70	0.0000	3.9932	-2.3054	.0430	.1507	.2276	130.1	109.9	106.4	12.049	-168.9

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
14	71	0.0000	4.1283	-2.3833	.2286	.2530	.2177	106.2	104.5	103.4	.987	60.0
14	72	0.0000	4.2634	-2.4612	.2224	.1310	.0000	103.1	102.2	103.1	14.179	13.1
		0.0000	0.0000	0.0000	GAP 9			GAP 9			13.028	-174.8
15	73	.0618	0.0000	.0288	.2031	.1496	.1414	-37.3	-10.0	29.0	14.106	-168.8
15	74	.1853	0.0000	.0865	.1383	.1716	.2144	26.4	56.5	72.3	11.152	-157.7
15	75	.3089	0.0000	.1442	.2174	.2374	.2203	72.1	80.2	84.6	3.442	-105.1
16	76	.4341	0.0000	.2026	.2233	.1641	.0699	83.9	86.2	85.5	10.815	-6.8
16	77	.5608	0.0000	.2619	.0712	.0429	.1536	83.1	-79.1	-86.3	15.793	.4
17	78	.6886	0.0000	.3215	.1545	.2432	.2894	-85.5	-86.8	-87.6	9.391	-.0
17	79	.8174	0.0000	.3816	.2911	.2842	.2239	-87.4	-88.4	-90.3	4.760	-167.8
17	80	.9461	0.0000	.4416	.2254	.1226	.0243	-90.3	-95.8	166.2	16.141	-174.4
17	81	1.0749	0.0000	.5017	.0246	.1369	.2393	168.0	103.8	98.7	16.101	-177.0
18	82	1.2035	0.0000	.5621	.2397	.2974	.2985	98.9	96.7	94.9	4.285	169.5
18	83	1.3318	0.0000	.6227	.2994	.2427	.1388	95.0	92.9	88.3	11.293	10.8
18	84	1.4601	0.0000	.6834	.1396	.0216	.1319	88.4	20.5	-75.2	18.693	6.4
18	85	1.5884	0.0000	.7441	.1319	.2431	.3094	-75.4	-80.2	-82.1	12.455	3.0
18	86	1.7168	0.0000	.8047	.3107	.3173	.2614	-82.2	-83.2	-84.0	3.487	-162.2
18	87	1.8451	0.0000	.8654	.2671	.1540	.0000	-84.2	-84.9	89.5	18.581	-174.2
		0.0000	0.0000	0.0000	GAP 10			GAP 10			13.028	5.2
19	88	-.0618	0.0000	-.0288	.2031	.1496	.1414	142.7	170.0	-151.0	14.106	11.2
19	89	-.1853	0.0000	-.0865	.1383	.1716	.2144	-153.6	-123.5	-107.7	11.152	22.3
19	90	-.3089	0.0000	-.1442	.2174	.2374	.2203	-107.9	-99.8	-95.4	3.442	74.9
20	91	-.4341	0.0000	-.2026	.2233	.1641	.0699	-96.1	-93.8	-94.5	10.815	173.2
20	92	-.5608	0.0000	-.2619	.0712	.0429	.1536	-96.9	100.9	93.7	15.793	-179.6
21	93	-.6886	0.0000	-.3215	.1545	.2432	.2894	94.5	93.2	92.4	9.391	180.0
21	94	-.8174	0.0000	-.3816	.2911	.2842	.2239	92.6	91.6	89.7	4.760	12.2
21	95	-.9461	0.0000	-.4416	.2254	.1226	.0243	89.7	84.2	-13.8	16.141	5.6
21	96	-1.0749	0.0000	-.5017	.0246	.1369	.2393	-12.0	-76.2	-81.3	16.101	3.0
22	97	-1.2035	0.0000	-.5621	.2397	.2974	.2985	-81.1	-83.3	-85.1	4.285	-10.5
22	98	-1.3318	0.0000	-.6227	.2994	.2427	.1388	-85.0	-87.1	-91.7	11.293	-169.2
22	99	-1.4601	0.0000	-.6834	.1396	.0216	.1319	-91.6	-159.5	104.8	18.693	-173.6
22	100	-1.5884	0.0000	-.7441	.1319	.2431	.3094	104.6	99.8	97.9	12.455	-177.0
22	101	-1.7168	0.0000	-.8047	.3107	.3173	.2614	97.8	96.8	96.0	3.487	17.8
22	102	-1.8451	0.0000	-.8654	.2671	.1540	.0000	95.8	95.1	-90.5	18.581	5.8

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IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	610.681	756.893	.000646	-.000800	0.000	0.000	610.681	756.893	1000.000	0.0
2	610.681	756.893	.000646	-.000800	0.000	0.000	610.681	756.893	1000.000	-180.0
3					INFINITE	INFINITE	-69.755	45.932	8.141	-41.4
6					INFINITE	INFINITE	-69.755	45.932	8.141	138.6
9					INFINITE	INFINITE	.000	-.000	.000	-115.3
10					INFINITE	INFINITE	-.000	.000	.000	-115.3

	OHMS	OHMS	MHOS	MHOS	OHMS	OHMS	OHMS	OHMS	VOLT	DEGREES
4					INFINITE	INFINITE	-600.000	.000	126.437	-82.3
7					INFINITE	INFINITE	-600.000	-.000	126.437	97.7

INPUT POWER =	1291.328 WATTS
RADIATED POWER =	1182.102 WATTS
WIRE LOSS =	.000 WATTS
NETWORK LOSS =	109.226 WATTS
RADIATION EFFICIENCY =	91.54 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

		COORDINATES			CURRENT DISTRIBUTION						NORMAL ELECTRIC FIELD * RADIUS	
		X	Y	Z	AMPLITUDE			PHASE				
WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			149.950	9.0
1	1	0.0000	0.0000	.0682	1.3117	2.0487	2.4562	-36.9	-55.1	-61.0	98.757	6.0
1	2	0.0000	0.0000	.2046	2.4237	2.3768	1.9086	-59.7	-62.3	-64.0	39.009	-134.1
1	3	0.0000	0.0000	.3411	1.9425	1.0999	.0000	-63.8	-64.9	-63.4	140.220	-153.8
		0.0000	0.0000	0.0000	GAP 2			GAP 2			149.950	9.0
2	4	0.0000	0.0000	-.0682	1.3117	2.0487	2.4562	-36.9	-55.1	-61.0	98.757	6.0
2	5	0.0000	0.0000	-.2046	2.4237	2.3768	1.9086	-59.7	-62.3	-64.0	39.009	-134.1
2	6	0.0000	0.0000	-.3411	1.9425	1.0999	.0000	-63.8	-64.9	-63.4	140.220	-153.8
		0.0000	0.0000	0.0000	GAP 3			GAP 3			63.315	165.7
3	7	0.0000	.0590	.0342	.6661	.8413	.9073	139.4	112.0	89.6	50.387	132.8
3	8	0.0000	.1770	.1025	.8693	.8878	.9154	87.8	63.2	38.1	54.253	66.2

WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
3	9	0.0000	.2950	.1708	.9170	.9622	1.0027	37.7	13.7	-8.5	54.762	20.6
4	10	0.0000	.4146	.2399	1.0050	1.0161	.9862	-8.4	-29.9	-51.6	51.729	-31.4
4	11	0.0000	.5357	.3098	.9868	.9275	.8731	-51.5	-75.0	-101.5	55.923	-83.9
5	12	0.0000	.6579	.3802	.8721	.8557	.8862	-101.3	-130.2	-158.1	58.055	-128.9
5	13	0.0000	.7812	.4513	.8845	.9297	.9525	-158.0	176.8	153.9	52.109	-177.3
5	14	0.0000	.9045	.5223	.9509	.9316	.8805	154.0	131.4	107.1	50.749	125.5
5	15	0.0000	1.0278	.5934	.8791	.8296	.8200	107.2	79.9	50.6	55.976	75.2
6	16	0.0000	1.1569	.6679	.8185	.8604	.9157	50.7	20.0	-7.0	53.630	27.7
6	17	0.0000	1.2918	.7459	.9144	.9337	.9000	-7.0	-31.5	-56.3	48.256	-32.6
6	18	0.0000	1.4267	.8239	.8989	.8355	.7956	-56.2	-83.9	-115.3	53.590	-91.9
6	19	0.0000	1.5616	.9020	.7943	.8145	.8728	-115.3	-147.4	-176.2	54.070	-141.1
6	20	0.0000	1.6966	.9800	.8718	.9131	.9029	-176.2	158.5	134.3	47.449	161.2
6	21	0.0000	1.8315	1.0580	.9022	.8465	.7908	134.3	108.2	78.1	51.301	99.2
6	22	0.0000	1.9664	1.1361	.7897	.7866	.8399	78.1	45.5	15.1	54.401	49.5
6	23	0.0000	2.1013	1.2141	.8389	.8972	.9104	15.1	-11.2	-35.0	47.421	-5.0
7	24	0.0000	2.2364	1.2921	.9099	.8651	.7939	-35.0	-59.6	-87.9	48.808	-69.3
7	25	0.0000	2.3716	1.3700	.7929	.7564	.7907	-87.9	-120.5	-153.1	54.373	-120.6
7	26	0.0000	2.5067	1.4480	.7894	.8590	.8999	-153.1	178.7	154.3	48.062	-171.9
7	27	0.0000	2.6419	1.5259	.9000	.8779	.8058	154.3	130.7	104.3	46.240	122.5
7	28	0.0000	2.7771	1.6039	.8057	.7423	.7537	104.4	72.7	38.3	54.222	68.4
7	29	0.0000	2.9123	1.6818	.7514	.8319	.9081	38.3	7.8	-16.9	49.816	20.9
7	30	0.0000	3.0474	1.7597	.9096	.9191	.8437	-17.2	-39.1	-62.2	42.964	-44.9
7	31	0.0000	3.1826	1.8377	.8650	.7296	.6630	-62.0	-91.2	-133.0	57.487	-108.0
		0.0000	3.2502	1.8767			GAP 4			GAP 4	64.612	-129.2
		0.0000	3.2502	1.8767	GAP 5					GAP 5	9.078	4.1
8	32	0.0000	3.3178	1.9156	.6630	.6266	.4262	-133.0	-130.0	-130.8	15.155	133.1
8	33	0.0000	3.4528	1.9936	.4221	.1185	.2483	-133.6	-154.5	64.9	42.225	143.2
8	34	0.0000	3.5879	2.0715	.2519	.5445	.7160	65.2	57.0	54.1	30.043	138.1
8	35	0.0000	3.7230	2.1495	.7188	.7237	.5581	54.0	51.8	48.9	10.851	-19.1
8	36	0.0000	3.8581	2.2274	.5598	.2630	.1218	48.9	41.1	-100.1	42.531	-35.7
8	37	0.0000	3.9932	2.3054	.1215	.4554	.6955	-100.7	-121.7	-125.1	37.416	-40.0
8	38	0.0000	4.1283	2.3833	.6988	.7770	.6704	-125.4	-127.1	-128.2	2.813	-166.8
8	39	0.0000	4.2634	2.4612	.6849	.4040	.0000	-128.5	-129.5	-128.6	43.658	141.5
		0.0000	0.0000	0.0000	GAP 6					GAP 6	63.315	165.7
9	40	0.0000	.0590	-.0342	.6661	.8413	.9073	139.4	112.0	89.6	50.387	132.8
9	41	0.0000	.1770	-.1025	.8693	.8878	.9154	87.8	63.2	38.1	54.253	66.2
9	42	0.0000	.2950	-.1708	.9170	.9622	1.0027	37.7	13.7	-8.5	54.762	20.6
10	43	0.0000	.4146	-.2399	1.0050	1.0161	.9862	-8.4	-29.9	-51.6	51.729	-31.4
10	44	0.0000	.5357	-.3098	.9868	.9275	.8731	-51.5	-75.0	-101.5	55.923	-83.9
11	45	0.0000	.6579	-.3802	.8721	.8557	.8862	-101.3	-130.2	-158.1	58.055	-128.9
11	46	0.0000	.7812	-.4513	.8845	.9297	.9525	-158.0	176.8	153.9	52.109	-177.3
11	47	0.0000	.9045	-.5223	.9509	.9316	.8805	154.0	131.4	107.1	50.749	125.5
11	48	0.0000	1.0278	-.5934	.8791	.8296	.8200	107.2	79.9	50.6	55.976	75.2
12	49	0.0000	1.1569	-.6679	.8185	.8604	.9157	50.7	20.0	-7.0	53.630	27.7
12	50	0.0000	1.2918	-.7459	.9144	.9337	.9000	-7.0	-31.5	-56.3	48.256	-32.6
12	51	0.0000	1.4267	-.8239	.8989	.8355	.7956	-56.2	-83.9	-115.3	53.590	-91.9
12	52	0.0000	1.5616	-.9020	.7943	.8145	.8728	-115.3	-147.4	-176.2	54.070	-141.1
12	53	0.0000	1.6966	-.9800	.8718	.9131	.9029	-176.2	158.5	134.3	47.449	161.2
12	54	0.0000	1.8315	-1.0580	.9022	.8465	.7908	134.3	108.2	78.1	51.301	99.2
12	55	0.0000	1.9664	-1.1361	.7897	.7866	.8399	78.1	45.5	15.1	54.401	49.5
12	56	0.0000	2.1013	-1.2141	.8389	.8972	.9104	15.1	-11.2	-35.0	47.421	-5.0
13	57	0.0000	2.2364	-1.2921	.9099	.8651	.7939	-35.0	-59.6	-87.9	48.808	-69.3

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE X	AMPLITUDE Y	AMPLITUDE Z	PHASE X DEG	PHASE Y DEG	PHASE Z DEG	VOLTS	DEG
13	58	0.0000	2.3716	-1.3700	.7929	.7564	.7907	-87.9	-120.5	-153.1	54.373	-120.6
13	59	0.0000	2.5067	-1.4480	.7894	.8590	.8999	-153.1	178.7	154.3	48.062	-171.9
13	60	0.0000	2.6419	-1.5259	.9000	.8779	.8058	154.3	130.7	104.3	46.240	122.5
13	61	0.0000	2.7771	-1.6039	.8057	.7423	.7537	104.4	72.7	38.3	54.222	68.4
13	62	0.0000	2.9123	-1.6818	.7514	.8319	.9081	38.3	7.8	-16.9	49.816	20.9
13	63	0.0000	3.0474	-1.7597	.9096	.9191	.8437	-17.2	-39.1	-62.2	42.964	-44.9
13	64	0.0000	3.1826	-1.8377	.8650	.7296	.6630	-62.0	-91.2	-133.0	57.487	-108.0
		0.0000	3.2502	-1.8767			GAP 7			GAP 7	64.612	-129.2
		0.0000	3.2502	-1.8767	GAP 8			GAP 8			9.078	4.1
14	65	0.0000	3.3178	-1.9156	.6630	.6266	.4262	-133.0	-130.0	-130.8	15.155	133.1
14	66	0.0000	3.4528	-1.9936	.4221	.1185	.2483	-133.6	-154.5	64.9	42.225	143.2
14	67	0.0000	3.5879	-2.0715	.2519	.5445	.7160	65.2	57.0	54.1	30.043	138.1
14	68	0.0000	3.7230	-2.1495	.7188	.7237	.5581	54.0	51.8	48.9	10.851	-19.1
14	69	0.0000	3.8581	-2.2274	.5598	.2630	.1218	48.9	41.1	-100.1	42.531	-35.7
14	70	0.0000	3.9932	-2.3054	.1215	.4554	.6955	-100.7	-121.7	-125.1	37.416	-40.0
14	71	0.0000	4.1283	-2.3833	.6988	.7770	.6704	-125.4	-127.1	-128.2	2.813	-166.8
14	72	0.0000	4.2634	-2.4612	.6849	.4040	.0000	-128.5	-129.5	-128.6	43.658	141.5
		0.0000	0.0000	0.0000	GAP 9			GAP 9			12.275	174.3
15	73	.0618	0.0000	.0288	.0881	.0279	.1908	-115.3	-19.2	6.1	17.932	113.8
15	74	.1853	0.0000	.0865	.2306	.4229	.5687	1.0	.5	-1.0	24.432	87.5
15	75	.3089	0.0000	.1442	.5783	.6422	.6038	-1.2	-3.2	-5.8	3.887	24.8
16	76	.4341	0.0000	.2026	.6087	.4672	.2508	-5.9	-10.6	-23.7	26.637	-84.1
16	77	.5608	0.0000	.2619	.2537	.1120	.3192	-23.7	-110.7	-162.9	37.890	+90.9
17	78	.6886	0.0000	.3215	.3185	.5208	.6307	-162.6	-172.2	176.7	22.988	-100.2
17	79	.8174	0.0000	.3816	.6309	.6228	.4977	176.6	179.9	175.7	10.653	119.4
17	80	.9461	0.0000	.4416	.4984	.2827	.0818	175.8	166.7	90.2	34.668	95.2
17	81	1.0749	0.0000	.5017	.0810	.2857	.4995	90.7	16.8	8.1	34.445	88.8
18	82	1.2035	0.0000	.5621	.4994	.6205	.6228	8.1	4.2	1.4	8.703	66.8
18	83	1.3318	0.0000	.6227	.6234	.5053	.2910	1.4	-1.9	-8.8	23.714	-79.9
18	84	1.4601	0.0000	.6834	.2915	.0638	.2757	-8.5	-78.0	165.1	38.636	-87.1
18	85	1.5884	0.0000	.7441	.2751	.5005	.6335	165.4	172.3	-175.0	25.393	-92.1
18	86	1.7168	0.0000	.8047	.6352	.6461	.5304	175.1	-176.6	-177.7	7.520	108.0
18	87	1.8451	0.0000	.8654	.5408	.3105	.0000	177.9	178.8	176.2	37.616	92.1
		0.0000	0.0000	0.0000	GAP 10			GAP 10			12.275	174.3
19	88	-.0618	0.0000	-.0288	.0881	.0279	.1908	115.3	19.2	6.1	17.932	113.8
19	89	-.1853	0.0000	-.0865	.2306	.4229	.5687	1.0	.5	1.0	24.432	87.5
19	90	-.3089	0.0000	-.1442	.5783	.6422	.6038	1.2	3.2	5.8	3.887	24.8
20	91	-.4341	0.0000	-.2026	.6087	.4672	.2508	5.9	10.6	23.7	26.637	84.1
20	92	-.5608	0.0000	-.2619	.2537	.1120	.3192	-23.7	-110.7	162.9	37.890	-90.9
21	93	-.6886	0.0000	-.3215	.3185	.5208	.6307	162.6	172.2	176.7	22.988	100.2
21	94	-.8174	0.0000	-.3816	.6309	.6228	.4977	-176.6	179.9	175.7	10.653	-119.4
21	95	-.9461	0.0000	-.4416	.4984	.2827	.0818	175.8	166.7	90.2	34.668	95.2
21	96	-1.0749	0.0000	-.5017	.0810	.2857	.4995	90.7	16.8	8.1	34.445	88.8
22	97	-1.2035	0.0000	-.5621	.4994	.6205	.6228	8.1	4.2	1.4	8.703	66.8
22	98	-1.3318	0.0000	-.6227	.6234	.5053	.2910	1.4	1.9	8.8	23.714	-79.9
22	99	-1.4601	0.0000	-.6834	.2915	.0638	.2757	8.5	78.0	165.1	38.636	87.1
22	100	-1.5884	0.0000	-.7441	.2751	.5005	.6335	165.4	172.3	175.0	25.393	-92.1
22	101	-1.7168	0.0000	-.8047	.6352	.6461	.5304	175.1	176.6	177.7	47.520	108.0
22	102	-1.8451	0.0000	-.8654	.5408	.3105	.0000	177.9	178.8	176.2	37.616	92.1

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	609.828	457.488	.001049	-.000787	0.000	0.000	609.828	457.488	1000.000	0.0
2	609.828	457.488	.001049	-.000787	0.000	0.000	609.828	457.488	1000.000	0.0
3					INFINITE	INFINITE	-69.755	45.932	55.634	-74.0
6					INFINITE	INFINITE	-69.755	45.932	55.634	-74.0
9					INFINITE	INFINITE	-.000	3239.795	285.301	-25.3
10					INFINITE	INFINITE	-.000	3239.795	285.301	-25.3
4					INFINITE	INFINITE	-600.000	-.000	397.814	-133.0
7					INFINITE	INFINITE	-600.000	-.000	397.814	-133.0

INPUT POWER = 2098.565 WATTS
RADIATED POWER = 919.719 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 1178.846 WATTS
RADIATION EFFICIENCY = 43.83 PER CENT

WIRE COORDINATES IN FEET AND WIRE RADII IN INCHES

WIRE NO		X1	Y1	Z1	RAD1		X2	Y2	Z2	RAD2	INTERVALS
1	GAP 1	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	61.5000	.250000	4
2	GAP 2	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	-61.5000	.250000	4
3	GAP 3	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	30.8000	.250000	4
4		-0.0000	53.2000	30.8000	.250000		-0.0000	89.6000	51.8000	.250000	3
5		-0.0000	89.6000	51.8000	.250000		-0.0000	163.7000	94.5000	.250000	5
6		-0.0000	163.7000	94.5000	.250000		-0.0000	325.9000	188.3000	.250000	11
7		-0.0000	325.9000	188.3000	.250000	GAP 4	-0.0000	488.4000	282.0000	.250000	11
8	GAP 5	-0.0000	488.4000	282.0000	.250000		-0.0000	650.8000	375.7000	.250000	11
9	GAP 6	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	-30.8000	.250000	4
10		-0.0000	53.2000	-30.8000	.250000		-0.0000	89.6000	-51.8000	.250000	3
11		-0.0000	89.6000	-51.8000	.250000		-0.0000	163.7000	-94.5000	.250000	5
12		-0.0000	163.7000	-94.5000	.250000		-0.0000	325.9000	-188.3000	.250000	11
13		-0.0000	325.9000	-188.3000	.250000	GAP 7	-0.0000	488.4000	-282.0000	.250000	11
14	GAP 8	-0.0000	488.4000	-282.0000	.250000		-0.0000	650.8000	-375.7000	.250000	11
15	GAP 9	-0.0000	-0.0000	-0.0000	.290000		55.7000	-0.0000	26.0000	.290000	4
16		55.7000	-0.0000	26.0000	.290000		93.8000	-0.0000	43.8000	.290000	3
17		93.8000	-0.0000	43.8000	.290000		171.2000	-0.0000	79.9000	.290000	5
18		171.2000	-0.0000	79.9000	.290000		286.9000	-0.0000	134.6000	.290000	8
19	GAP 10	-0.0000	-0.0000	-0.0000	.290000		-55.7000	-0.0000	-26.0000	.290000	4
20		-55.7000	-0.0000	-26.0000	.290000		-93.8000	-0.0000	-43.8000	.290000	3
21		-93.8000	-0.0000	-43.8000	.290000		-171.2000	-0.0000	-79.9000	.290000	5
22		-171.2000	-0.0000	-79.9000	.290000		-286.9000	-0.0000	-134.6000	.290000	8

FREQUENCY = 9.1800 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 392

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 32.5 PER CENT FOR GAPS 4 AND 9

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

A-90

NONRADIATING NETWORKS CONNECTING THE GAPS

NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9-10	-0.0000	-0.0000	-0.0000	-0.0000

COORDINATES CURRENT DISTRIBUTION NORMAL ELECTRIC FIELD * RADIUS

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1			198.948	-1.4
1	1	0.0000	0.0000	.0717	1.8193	.5431	1.1536	72.5	25.6	-69.5	194.274	-2.9
1	2	0.0000	0.0000	.2151	1.0483	1.9725	2.5300	-66.9	-81.1	-85.7	108.485	-8.1
1	3	0.0000	0.0000	.3585	2.5192	2.5734	2.1169	-85.6	-88.0	-89.5	29.794	-156.0
1	4	0.0000	0.0000	.5019	2.1562	1.2378	.0000	-89.5	-90.6	-92.6	148.556	-179.5
		0.0000	0.0000	.0000	GAP 2			GAP 2			198.948	178.6
2	5	0.0000	0.0000	-.0717	1.8193	.5431	1.1536	-107.5	-154.4	110.5	194.274	177.1
2	6	0.0000	0.0000	-.2151	1.0483	1.9725	2.5300	113.1	98.9	94.3	108.485	171.9
2	7	0.0000	0.0000	-.3585	2.5192	2.5734	2.1169	94.4	92.0	90.5	29.794	24.0
2	8	0.0000	0.0000	-.5019	2.1562	1.2378	.0000	90.5	89.4	87.4	148.556	.5
		0.0000	0.0000	0.0000	GAP 3			GAP 3			21.573	179.6
3	9	0.0000	.0620	.0359	.1835	.0480	.0486	-105.0	-131.9	79.5	15.989	166.0
3	10	0.0000	.1861	.1077	.0264	.0878	.1380	66.4	40.1	23.5	8.269	104.9
3	11	0.0000	.3101	.1795	.1399	.1778	.2016	22.0	6.4	-9.8	7.632	38.5
3	12	0.0000	.4342	.2514	.2060	.2156	.2141	-10.0	-27.5	-47.7	9.370	-25.6
4	13	0.0000	.5528	.3199	.2177	.2128	.2119	-47.5	-68.5	-91.9	12.212	-71.6
4	14	0.0000	.6659	.3852	.2141	.2204	.2327	-91.5	-115.2	-137.7	13.239	-109.0
4	15	0.0000	.7791	.4505	.2342	.2456	.2511	-137.2	-157.8	-177.2	12.529	-151.8
5	16	0.0000	.9048	.5230	.2525	.2465	.2320	-176.8	159.4	133.1	12.874	153.0
5	17	0.0000	1.0430	.6026	.2332	.2204	.2216	133.7	103.9	72.4	14.478	100.6
5	18	0.0000	1.1813	.6823	.2219	.2336	.2445	72.9	43.7	17.5	13.594	50.5
5	19	0.0000	1.3195	.7619	.2445	.2435	.2310	17.9	-6.8	-33.0	12.774	-11.0
5	20	0.0000	1.4577	.8416	.2310	.2160	.2125	-32.7	-62.2	-94.5	14.257	-67.5
6	21	0.0000	1.5956	.9212	.2124	.2227	.2365	-94.2	-125.1	-152.4	13.739	-117.8
6	22	0.0000	1.7331	1.0007	.2364	.2406	.2316	-152.2	-177.2	157.4	12.486	-178.7
6	23	0.0000	1.8706	1.0802	.2316	.2159	.2080	157.6	129.1	97.1	13.938	122.1
6	24	0.0000	2.0082	1.1598	.2080	.2155	.2314	97.2	65.1	36.6	13.960	72.1
6	25	0.0000	2.1457	1.2393	.2313	.2408	.2365	36.7	11.4	-13.4	12.412	13.0
6	26	0.0000	2.2832	1.3188	.2365	.2216	.2092	-13.2	-40.3	-71.1	13.608	-48.5
6	27	0.0000	2.4208	1.3984	.2091	.2110	.2252	-71.0	-103.6	-133.4	14.131	-98.7
6	28	0.0000	2.5583	1.4779	.2251	.2373	.2367	-133.3	-159.5	175.9	12.413	-155.7
6	29	0.0000	2.6958	1.5574	.2367	.2229	.2071	176.0	149.9	119.8	13.202	140.8
6	30	0.0000	2.8333	1.6370	.2070	.2039	.2170	120.0	86.8	55.4	14.205	89.8
6	31	0.0000	2.9709	1.7165	.2168	.2329	.2381	55.4	28.3	3.8	12.475	35.1
7	32	0.0000	3.1085	1.7960	.2380	.2279	.2105	3.9	-21.2	-49.7	12.752	-29.9
7	33	0.0000	3.2463	1.8754	.2103	.2013	.2103	-49.6	-82.3	-114.9	14.206	-82.3
7	34	0.0000	3.3841	1.9549	.2100	.2273	.2366	-114.9	-143.3	-168.1	12.607	-134.7
7	35	0.0000	3.5219	2.0343	.2366	.2296	.2108	-168.1	167.7	140.4	12.267	159.4
7	36	0.0000	3.6597	2.1138	.2107	.1958	.2002	140.5	108.2	74.0	14.119	105.0
7	37	0.0000	3.7974	2.1932	.1999	.2190	.2344	74.0	43.8	18.5	12.799	54.8
7	38	0.0000	3.9352	2.2727	.2345	.2332	.2153	18.5	-5.1	-30.7	11.774	-11.5
7	39	0.0000	4.0730	2.3521	.2154	.1952	.1937	-30.6	-61.8	-97.1	14.090	-68.5
7	40	0.0000	4.2108	2.4316	.1931	.2138	.2368	-97.1	-129.2	-155.0	13.239	-115.6
7	41	0.0000	4.3486	2.5110	.2373	.2427	.2231	-155.2	-177.3	160.0	11.022	178.1
7	42	0.0000	4.4864	2.5905	.2294	.1902	.1689	160.2	131.1	87.5	15.092	112.2
		0.0000	4.5553	2.6302			GAP 4			GAP 4	17.194	91.0
		0.0000	4.5553	2.6302	GAP 5			GAP 5			2.611	-130.7

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
8	43	0.0000	4.6241	2.6699	.1689	.1593	.1058	87.5	91.3	91.1	3.989	-8.6
8	44	0.0000	4.7618	2.7494	.1045	.0244	.0714	87.8	62.1	-76.2	10.916	4.3
8	45	0.0000	4.8995	2.8288	.0724	.1471	.1876	-75.7	-82.4	-85.2	7.318	-1.1
8	46	0.0000	5.0372	2.9083	.1884	.1837	.1342	-85.2	-87.6	-91.2	3.553	-160.9
8	47	0.0000	5.1749	2.9877	.1346	.0534	.0492	-91.3	-104.3	114.4	11.286	-174.5
8	48	0.0000	5.3126	3.0672	.0493	.1333	.1875	114.4	99.8	96.0	8.869	179.7
8	49	0.0000	5.4503	3.1466	.1880	.1972	.1585	96.0	93.5	90.5	2.122	32.7
8	50	0.0000	5.5880	3.2260	.1590	.0818	.0251	90.6	83.5	-43.9	11.119	6.4
8	51	0.0000	5.7257	3.3055	.0248	.1151	.1835	-44.5	-78.7	-82.8	10.321	1.8
8	52	0.0000	5.8634	3.3849	.1843	.2087	.1819	-83.1	-84.9	-86.2	.638	-98.2
8	53	0.0000	6.0011	3.4644	.1861	.1104	.0000	-86.4	-87.5	-88.2	11.659	-176.4
		0.0000	0.0000	0.0000	GAP 6			GAP 6			21.573	-.4
9	54	0.0000	.0620	-.0359	.1835	.0480	.0486	75.0	48.1	-100.5	15.989	-14.0
9	55	0.0000	.1861	-.1077	.0264	.0878	.1380	-113.6	-139.9	-156.5	8.269	-75.1
9	56	0.0000	.3101	-.1795	.1399	.1778	.2016	-158.0	-173.6	170.2	7.632	-141.5
9	57	0.0000	.4342	-.2514	.2060	.2156	.2141	170.0	152.5	132.3	9.370	154.4
10	58	0.0000	.5528	-.3199	.2177	.2128	.2119	132.5	111.5	88.1	12.212	108.4
10	59	0.0000	.6659	-.3852	.2141	.2204	.2327	88.5	64.8	42.3	13.239	71.0
10	60	0.0000	.7791	-.4505	.2342	.2456	.2511	42.8	22.2	2.8	12.529	28.2
11	61	0.0000	.9048	-.5230	.2525	.2465	.2320	3.2	-20.6	-46.9	12.874	-27.0
11	62	0.0000	1.0430	-.6026	.2332	.2204	.2216	-46.3	-76.1	-107.6	14.478	-79.4
11	63	0.0000	1.1813	-.6823	.2219	.2336	.2445	-107.1	-136.3	-162.5	13.594	-129.5
11	64	0.0000	1.3195	-.7619	.2445	.2435	.2310	-162.1	173.2	147.0	12.774	169.0
11	65	0.0000	1.4577	-.8416	.2310	.2160	.2125	147.3	117.8	85.5	14.257	112.5
12	66	0.0000	1.5956	-.9212	.2124	.2227	.2365	85.8	54.9	27.6	13.739	62.2
12	67	0.0000	1.7331	-1.0007	.2364	.2406	.2316	27.8	2.8	-22.6	12.486	1.3
12	68	0.0000	1.8706	-1.0802	.2316	.2159	.2080	-22.4	-50.9	-82.9	13.938	-57.9
12	69	0.0000	2.0082	-1.1598	.2080	.2155	.2314	-82.8	-114.9	-143.4	13.960	-107.9
12	70	0.0000	2.1457	-1.2393	.2313	.2408	.2365	-143.3	-168.6	166.6	12.412	-167.0
12	71	0.0000	2.2832	-1.3188	.2365	.2216	.2092	166.8	139.7	108.9	13.608	131.5
12	72	0.0000	2.4208	-1.3984	.2091	.2110	.2252	109.0	76.4	46.6	14.131	81.8
12	73	0.0000	2.5583	-1.4779	.2251	.2373	.2367	46.7	20.5	-4.1	12.413	24.3
12	74	0.0000	2.6958	-1.5574	.2367	.2229	.2071	-4.0	-30.1	-60.2	13.202	-39.2
12	75	0.0000	2.8333	-1.6370	.2070	.2039	.2170	-60.0	-93.2	-124.6	14.205	-90.2
12	76	0.0000	2.9709	-1.7165	.2168	.2329	.2381	-124.6	-151.7	-176.2	12.475	-144.9
13	77	0.0000	3.1085	-1.7960	.2380	.2279	.2105	-176.1	158.8	130.3	12.752	150.1
13	78	0.0000	3.2463	-1.8754	.2103	.2013	.2103	130.4	97.7	65.1	14.206	97.7
13	79	0.0000	3.3841	-1.9549	.2100	.2273	.2366	65.1	36.7	11.9	12.607	45.3
13	80	0.0000	3.5219	-2.0343	.2366	.2296	.2108	11.9	-12.3	-39.6	12.267	-20.6
13	81	0.0000	3.6597	-2.1138	.2107	.1958	.2002	-39.5	-71.8	-106.0	14.119	-75.0
13	82	0.0000	3.7974	-2.1932	.1999	.2190	.2344	-106.0	-136.2	-161.5	12.799	-125.2
13	83	0.0000	3.9352	-2.2727	.2345	.2332	.2153	-161.5	174.9	149.3	11.774	168.5
13	84	0.0000	4.0730	-2.3521	.2154	.1952	.1937	149.4	118.2	82.9	14.090	111.5
13	85	0.0000	4.2108	-2.4316	.1931	.2138	.2368	82.9	50.8	25.0	13.239	64.4
13	86	0.0000	4.3486	-2.5110	.2373	.2427	.2231	24.8	2.7	-20.0	11.022	-1.9
13	87	0.0000	4.4864	-2.5905	.2294	.1902	.1689	-19.8	-48.9	-92.5	15.092	-67.8
		0.0000	4.5553	-2.6302			GAP 7			GAP 7	17.194	-89.0
		0.0000	4.5553	-2.6302	GAP 8			GAP 8			2.611	49.3
14	88	0.0000	4.6241	-2.6699	.1689	.1593	.1058	-92.5	-88.7	-88.9	3.989	171.4
14	89	0.0000	4.7618	-2.7494	.1045	.0244	.0714	-92.2	-117.9	103.8	10.916	-175.7
14	90	0.0000	4.8995	-2.8288	.0724	.1471	.1876	104.3	97.6	94.8	7.318	178.9
14	91	0.0000	5.0372	-2.9083	.1884	.1837	.1342	94.8	92.4	88.8	3.553	19.1

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
14	92	0.0000	5.1749	-2.9877	.1346	.0534	.0492	88.7	75.7	-65.6	11.786	5.5
14	93	0.0000	5.3126	-3.0672	.0493	.1333	.1875	-65.6	-80.2	-84.0	8.869	-.3
14	94	0.0000	5.4503	-3.1466	.1880	.1972	.1585	-84.0	-86.5	-89.5	2.122	-147.3
14	95	0.0000	5.5880	-3.2260	.1590	.0818	.0251	-89.4	-96.5	136.1	11.119	-173.6
14	96	0.0000	5.7257	-3.3055	.0248	.1151	.1835	135.5	101.3	97.2	10.321	-178.2
14	97	0.0000	5.8634	-3.3849	.1843	.2087	.1819	96.9	95.1	93.8	.638	81.8
14	98	0.0000	6.0011	-3.4644	.1861	.1104	.0000	93.6	92.5	91.8	11.659	3.6
		-.0000	0.0000	-.0000	GAP 9			GAP 9			16.834	-175.0
15	99	.0649	0.0000	.0303	.1667	.1529	.1580	-17.4	21.1	42.0	11.105	-165.0
15	100	.1948	0.0000	.0909	.1501	.1277	.0805	37.5	46.1	45.1	4.902	-61.2
15	101	.3247	0.0000	.1516	.0822	.0311	.0838	43.1	-12.1	-86.3	10.346	-21.4
15	102	.4546	0.0000	.2122	.0850	.1600	.2184	-83.5	-93.5	-96.3	9.433	-14.2
16	103	.5787	0.0000	.2702	.2201	.2461	.2400	-95.5	-97.0	-98.7	1.785	-40.1
16	104	.6972	0.0000	.3255	.2421	.2031	.1364	-98.3	-101.1	-107.6	8.241	-176.8
16	105	.8156	0.0000	.3808	.1385	.0601	.0658	-107.3	-133.7	127.2	13.881	179.6
17	106	.9471	0.0000	.4422	.0652	.1598	.2278	129.0	102.8	96.4	11.027	174.8
17	107	1.0914	0.0000	.5095	.2278	.2454	.2078	97.0	93.1	88.8	2.298	59.9
17	108	1.2358	0.0000	.5769	.2091	.1251	.0369	89.3	80.6	14.0	12.685	9.4
17	109	1.3802	0.0000	.6442	.0372	.1154	.2035	16.4	-67.0	-76.9	13.065	2.9
17	110	1.5246	0.0000	.7115	.2031	.2459	.2319	-76.6	-81.0	-84.6	2.606	-37.1
18	111	1.6642	0.0000	.7771	.2324	.1701	.0762	-84.3	-89.2	-105.1	10.851	-164.8
18	112	1.7991	0.0000	.8409	.0768	.0538	.1504	-104.6	135.8	110.0	14.480	-171.5
18	113	1.9340	0.0000	.9047	.1500	.2216	.2478	110.1	104.4	101.3	6.788	178.3
18	114	2.0689	0.0000	.9684	.2481	.2223	.1499	101.4	98.6	94.1	6.724	22.2
18	115	2.2038	0.0000	1.0322	.1505	.0493	.0750	94.4	74.3	-61.2	14.676	12.4
18	116	2.3387	0.0000	1.0960	.0745	.1732	.2378	-61.6	-72.6	-75.6	11.057	8.2
18	117	2.4736	0.0000	1.1597	.2385	.2528	.2127	-75.7	-77.3	-78.4	1.849	-145.1
18	118	2.6084	0.0000	1.2235	.2175	.1267	.0000	-78.5	-79.3	-80.1	14.441	-168.5
		.0000	0.0000	.0000	GAP 10			GAP 10			16.834	5.0
19	119	-.0649	0.0000	-.0303	.1667	.1529	.1580	162.6	-158.9	-138.0	11.105	15.0
19	120	-.1948	0.0000	-.0909	.1501	.1277	.0805	-142.5	-133.9	-134.9	4.902	118.8
19	121	-.3247	0.0000	-.1516	.0822	.0311	.0838	-136.9	167.9	93.7	10.346	158.6
19	122	-.4546	0.0000	-.2122	.0850	.1600	.2184	96.5	86.5	83.7	9.433	165.8
20	123	-.5787	0.0000	-.2702	.2201	.2461	.2400	84.5	83.0	81.3	1.785	139.9
20	124	-.6972	0.0000	-.3255	.2421	.2031	.1364	81.7	78.9	72.4	8.241	3.2
20	125	-.8156	0.0000	-.3808	.1385	.0601	.0658	72.7	46.3	-52.8	13.881	-.4
21	126	-.9471	0.0000	-.4422	.0652	.1598	.2278	-51.0	-77.2	-83.6	11.027	-5.2
21	127	-1.0914	0.0000	-.5095	.2278	.2454	.2078	-83.0	-86.9	-91.2	2.298	-120.1
21	128	-1.2358	0.0000	-.5769	.2091	.1251	.0369	-90.7	-99.4	-166.0	12.685	-170.6
21	129	-1.3802	0.0000	-.6442	.0372	.1154	.2035	-163.6	113.0	103.1	13.065	-177.1
21	130	-1.5246	0.0000	-.7115	.2031	.2459	.2319	103.4	99.0	95.4	2.606	142.9
22	131	-1.6642	0.0000	-.7771	.2324	.1701	.0762	95.7	90.8	74.9	10.851	15.2
22	132	-1.7991	0.0000	-.8409	.0768	.0538	.1504	75.4	-44.2	-70.0	14.480	8.5
22	133	-1.9340	0.0000	-.9047	.1500	.2216	.2478	-69.9	-75.6	-78.7	6.788	-1.7
22	134	-2.0689	0.0000	-.9684	.2481	.2223	.1499	-78.6	-81.4	-85.9	6.724	-157.8
22	135	-2.2038	0.0000	-1.0322	.1505	.0493	.0750	-85.6	-105.7	118.8	14.676	-167.6
22	136	-2.3387	0.0000	-1.0960	.0745	.1732	.2378	118.4	107.4	104.4	11.057	-171.8
22	137	-2.4736	0.0000	-1.1597	.2385	.2528	.2127	104.3	102.7	101.6	1.849	34.9
22	138	-2.6084	0.0000	-1.2235	.2175	.1267	.0000	101.5	100.7	99.9	14.441	11.5

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	165.069	-524.301	.000546	.001735	0.000	0.000	165.069	-524.301	1000.000	0.0
2	165.069	-524.301	.000546	.001735	0.000	0.000	165.069	-524.301	1000.000	-180.0
3					INFINITE	INFINITE	-54.005	49.839	13.485	32.3
6					INFINITE	INFINITE	-54.005	49.839	13.485	-147.7
9					INFINITE	INFINITE	.000	-.000	.000	-40.4
10					INFINITE	INFINITE	-.000	.000	.000	-40.4
4					INFINITE	INFINITE	-600.000	-.000	101.361	87.5
7					INFINITE	INFINITE	-600.000	-.000	101.361	-92.5

INPUT POWER = 1092.669 WATTS
RADIATED POWER = 1016.902 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 75.767 WATTS
RADIATION EFFICIENCY = 93.07 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED.

COORDINATES CURRENT DISTRIBUTION NORMAL ELECTRIC FIELD * RADIUS

WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1			158.615	-9.0
1	1	0.0000	0.0000	.0717	1.5774	.5142	.8763	65.2	27.2	-73.9	159.309	-10.5
1	2	0.0000	0.0000	.2151	.8055	1.5859	2.0735	-71.0	-87.8	-93.0	93.768	-15.9
1	3	0.0000	0.0000	.3585	2.0655	2.1326	1.7661	-93.0	-95.7	-97.5	23.035	-158.7
1	4	0.0000	0.0000	.5019	1.7968	1.0359	.0000	-97.5	-98.8	-101.2	123.796	172.5
		0.0000	0.0000	.0000	GAP 2			GAP 2			158.615	-9.0
2	5	0.0000	0.0000	-.0717	1.5774	.5142	.8763	65.2	27.2	-73.9	159.309	-10.5
2	6	0.0000	0.0000	-.2151	.8055	1.5859	2.0735	-71.0	-87.8	-93.0	93.768	-15.9
2	7	0.0000	0.0000	-.3585	2.0655	2.1326	1.7661	-93.0	-95.7	-97.5	23.035	-158.7
2	8	0.0000	0.0000	-.5019	1.7968	1.0359	.0000	-97.5	-98.8	-101.2	123.796	172.5
		0.0000	0.0000	0.0000	GAP 3			GAP 3			66.052	-165.1
3	9	0.0000	.0620	.0359	.7662	.5227	.4525	-123.0	-158.3	162.2	53.850	-179.0
3	10	0.0000	.1861	.1077	.4229	.3898	.4136	170.2	132.6	98.0	34.014	133.2
3	11	0.0000	.3101	.1795	.4002	.4456	.4855	98.1	68.7	44.4	28.036	82.0
3	12	0.0000	.4342	.2514	.4816	.4973	.4853	44.1	21.9	-.5	25.273	22.3
4	13	0.0000	.5528	.3199	.4847	.4594	.4365	-.6	-23.0	-48.0	28.005	-31.1
4	14	0.0000	.6659	.3852	.4364	.4309	.4453	-48.0	-74.6	-100.4	29.285	-73.0
4	15	0.0000	.7791	.4505	.4450	.4673	.4820	-100.4	-123.9	-145.2	26.719	-117.3
5	16	0.0000	.9048	.5230	.4815	.4759	.4491	-145.2	-170.6	162.3	25.773	-175.5
5	17	0.0000	1.0430	.6026	.4483	.4231	.4248	162.3	131.5	98.9	28.701	128.1
5	18	0.0000	1.1813	.6823	.4240	.4508	.4764	98.9	68.5	41.9	26.961	76.5
5	19	0.0000	1.3195	.7619	.4758	.4773	.4524	42.0	17.1	-8.8	24.898	13.5
5	20	0.0000	1.4577	.8416	.4517	.4193	.4085	-8.8	-38.4	-71.2	27.929	-44.7
6	21	0.0000	1.5956	.9212	.4077	.4275	.4560	-71.2	-102.9	-130.6	26.953	-95.3
6	22	0.0000	1.7331	1.0007	.4553	.4653	.4474	-130.6	-155.7	179.0	24.098	-156.9
6	23	0.0000	1.8706	1.0802	.4467	.4142	.3957	179.0	150.5	118.1	26.898	142.6
6	24	0.0000	2.0082	1.1598	.3951	.4089	.4395	118.0	85.3	56.4	26.899	92.3
6	25	0.0000	2.1457	1.2393	.4393	.4576	.4475	56.4	30.9	6.0	23.652	32.3
6	26	0.0000	2.2832	1.3188	.4474	.4164	.3918	6.0	-21.5	-53.2	26.173	-30.3
6	27	0.0000	2.4208	1.3984	.3917	.3991	.4318	-53.3	-86.7	-116.8	27.260	-80.5
6	28	0.0000	2.5583	1.4779	.4318	.4594	.4598	-116.8	-142.8	-167.1	23.805	-138.1
6	29	0.0000	2.6958	1.5574	.4600	.4333	.4025	-167.1	166.9	136.8	25.634	157.7
6	30	0.0000	2.8333	1.6370	.4024	.3977	.4244	136.8	103.6	72.3	27.685	107.0
6	31	0.0000	2.9709	1.7165	.4243	.4557	.4638	72.3	45.4	21.1	24.167	52.0
7	32	0.0000	3.1085	1.7960	.4638	.4411	.4049	21.1	-4.0	-32.9	24.930	-13.5
7	33	0.0000	3.2463	1.8754	.4047	.3881	.4091	-32.9	-66.2	-99.1	27.848	-65.5
7	34	0.0000	3.3841	1.9549	.4087	.4457	.4653	-99.1	-127.4	-151.9	24.543	-118.1
7	35	0.0000	3.5219	2.0343	.4653	.4514	.4145	-151.9	-176.0	156.7	24.079	175.6
7	36	0.0000	3.6597	2.1138	.4142	.3863	.3971	156.8	124.4	90.4	27.824	121.7
7	37	0.0000	3.7974	2.1932	.3963	.4348	.4642	90.4	60.6	35.7	25.027	71.7
7	38	0.0000	3.9352	2.2727	.4642	.4589	.4206	35.7	12.4	-13.1	23.022	5.1
7	39	0.0000	4.0730	2.3521	.4205	.3781	.3742	-13.0	-44.3	-80.0	27.570	-51.5
7	40	0.0000	4.2108	2.4316	.3725	.4132	.4579	-80.0	-112.3	-137.9	25.623	-98.4
7	41	0.0000	4.3486	2.5110	.4583	.4675	.4276	-138.2	-160.2	177.0	21.202	-165.4
7	42	0.0000	4.4864	2.5905	.4393	.3621	.3217	177.1	147.8	103.5	29.163	128.7
		0.0000	4.5553	2.6302			GAP 4			GAP 4	33.159	107.5
		0.0000	4.5553	2.6302	GAP 5			GAP 5			4.972	-121.1

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
8	43	0.0000	4.6241	2.6699	.3217	.3061	.2058	103.5	106.7	105.7	7.283	9.6
8	44	0.0000	4.7618	2.7494	.2034	.0528	.1344	102.4	74.5	-57.8	20.855	20.3
8	45	0.0000	4.8995	2.8288	.1365	.2796	.3585	-57.5	-65.9	-69.2	14.195	13.7
8	46	0.0000	5.0372	2.9083	.3599	.3527	.2600	-69.3	-72.1	-76.2	6.673	-142.2
8	47	0.0000	5.1749	2.9877	.2606	.1074	.0912	-76.3	-90.2	133.8	21.461	-158.6
8	48	0.0000	5.3126	3.0672	.0914	.2504	.3545	133.7	116.4	112.0	17.012	-165.1
8	49	0.0000	5.4503	3.1466	.3553	.3741	.3019	112.0	109.1	106.0	3.971	51.8
8	50	0.0000	5.5880	3.2260	.3027	.1574	.0464	106.0	98.7	-25.1	20.986	22.0
8	51	0.0000	5.7257	3.3055	.0457	.2154	.3448	-26.0	-63.0	-67.5	19.544	17.0
8	52	0.0000	5.8634	3.3849	.3463	.3927	.3426	-67.7	-69.7	-71.0	1.259	-80.0
8	53	0.0000	6.0011	3.4644	.3503	.2079	.0000	-71.3	-72.4	-73.2	21.942	-161.3
		0.0000	0.0000	0.0000	GAP 6			GAP 6			66.052	-165.1
9	54	0.0000	.0620	-.0359	.7662	.5227	.4525	-123.0	-158.3	162.2	53.850	-179.0
9	55	0.0000	.1861	-.1077	.4229	.3898	.4136	170.2	132.6	98.0	34.014	133.2
9	56	0.0000	.3101	-.1795	.4002	.4456	.4855	98.1	68.7	44.4	28.036	82.0
9	57	0.0000	.4342	-.2514	.4816	.4973	.4853	44.1	21.9	-.5	25.273	22.3
10	58	0.0000	.5528	-.3199	.4847	.4594	.4365	-.6	-23.0	-48.0	28.005	-31.1
10	59	0.0000	.6659	-.3852	.4364	.4309	.4453	-48.0	-74.6	-100.4	29.285	-73.0
10	60	0.0000	.7791	-.4505	.4450	.4673	.4820	-100.4	-123.9	-145.2	26.719	-117.3
10	60	0.0000	.7791	-.4505	.4450	.4673	.4820	-100.4	-123.9	-145.2	26.719	-117.3
11	61	0.0000	.9048	-.5230	.4815	.4759	.4491	-145.2	-170.6	162.3	25.773	-175.5
11	62	0.0000	1.0430	-.6026	.4483	.4231	.4248	162.3	131.5	98.9	28.701	128.1
11	63	0.0000	1.1813	-.6823	.4240	.4508	.4764	98.9	68.5	41.9	26.961	76.5
11	64	0.0000	1.3195	-.7619	.4758	.4773	.4524	42.0	17.1	-8.8	24.898	13.5
11	65	0.0000	1.4577	-.8416	.4517	.4193	.4085	-8.8	-38.4	-71.2	27.929	-44.7
12	66	0.0000	1.5956	-.9212	.4077	.4275	.4560	-71.2	-102.9	-130.6	26.953	-95.3
12	67	0.0000	1.7331	-1.0007	.4553	.4653	.4474	-130.6	-155.7	179.0	24.098	-156.9
12	68	0.0000	1.8706	-1.0802	.4467	.4142	.3957	179.0	150.5	118.1	26.898	142.6
12	69	0.0000	2.0082	-1.1598	.3951	.4089	.4395	118.0	85.3	56.4	26.899	92.3
12	70	0.0000	2.1457	-1.2393	.4393	.4576	.4475	56.4	30.9	6.0	23.652	32.3
12	71	0.0000	2.2832	-1.3188	.4474	.4164	.3918	6.0	-21.5	-53.2	26.173	-30.3
12	72	0.0000	2.4208	-1.3984	.3917	.3991	.4318	-53.3	-86.7	-116.8	27.760	-80.5
12	73	0.0000	2.5583	-1.4779	.4318	.4594	.4598	-116.8	-142.8	-167.1	23.805	-138.1
12	74	0.0000	2.6958	-1.5574	.4600	.4333	.4025	-167.1	166.9	136.8	25.634	157.7
12	75	0.0000	2.8333	-1.6370	.4024	.3977	.4244	136.8	103.6	72.3	27.685	107.0
12	76	0.0000	2.9709	-1.7165	.4243	.4557	.4638	72.3	45.4	21.1	24.167	52.0
13	77	0.0000	3.1085	-1.7960	.4638	.4411	.4049	21.1	-4.0	-32.9	24.930	-13.5
13	78	0.0000	3.2463	-1.8754	.4047	.3881	.4091	-32.9	-66.2	-99.1	27.848	-65.5
13	79	0.0000	3.3841	-1.9549	.4087	.4457	.4653	-99.1	-127.4	-151.9	24.543	-118.1
13	80	0.0000	3.5219	-2.0343	.4653	.4514	.4145	-151.9	-176.0	156.7	24.079	175.6
13	81	0.0000	3.6597	-2.1138	.4142	.3863	.3971	156.8	124.4	90.4	27.824	121.7
13	82	0.0000	3.7974	-2.1932	.3963	.4848	.4642	90.4	60.6	35.7	25.027	71.7
13	83	0.0000	3.9352	-2.2727	.4642	.4589	.4206	35.7	12.4	-13.1	23.022	5.1
13	84	0.0000	4.0730	-2.3521	.4205	.3781	.3742	-13.0	-44.3	-80.0	27.570	-51.5
13	85	0.0000	4.2108	-2.4316	.3725	.4132	.4579	-80.0	-112.3	-137.9	25.623	-98.4
13	86	0.0000	4.3486	-2.5110	.4583	.4675	.4276	-138.2	-160.2	177.0	21.202	-165.4
13	87	0.0000	4.4864	-2.5905	.4393	.3621	.3217	177.1	147.8	103.5	29.163	128.7
		0.0000	4.5553	-2.6302			GAP 7			GAP 7	33.159	107.5
		0.0000	4.5553	-2.6302	GAP 8			GAP 8			4.972	-121.1
14	88	0.0000	4.6241	-2.6699	.3217	.3061	.2058	103.5	106.7	105.7	7.283	9.6
14	89	0.0000	4.7618	-2.7494	.2034	.0528	.1344	102.4	74.5	-57.8	20.855	20.3
14	90	0.0000	4.8995	-2.8288	.1365	.2796	.3585	-57.5	-65.9	-69.2	14.195	13.7
14	91	0.0000	5.0372	-2.9083	.3599	.3527	.2600	-69.3	-72.1	-76.2	6.673	-142.2

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
14	92	0.0000	5.1749	-2.9877	.2606	.1074	.0912	-76.3	-90.2	133.8	21.461	-158.6
14	93	0.0000	5.3126	-3.0672	.0914	.2504	.3545	133.7	116.4	112.0	17.012	-165.1
14	94	0.0000	5.4503	-3.1466	.3553	.3741	.3019	112.0	109.1	106.0	3.971	51.8
14	95	0.0000	5.5880	-3.2260	.3027	.1574	.0464	106.0	98.7	-25.1	20.986	22.0
14	96	0.0000	5.7257	-3.3055	.0457	.2154	.3448	-26.0	-63.0	-67.5	19.544	17.0
14	97	0.0000	5.8634	-3.3849	.3463	.3927	.3426	-67.7	-69.7	-71.0	1.259	-80.0
14	98	0.0000	6.0011	-3.4644	.3503	.2079	.0000	-71.3	-72.4	-73.2	21.942	-161.3
		-.0000	0.0000	-.0000	GAP 9			GAP 9			68.884	89.7
15	99	.0649	0.0000	.0303	.2263	.6492	.9283	-40.4	-15.2	-14.5	50.424	83.3
15	100	.1948	0.0000	.0909	.9077	.9883	.8780	-16.5	-18.8	-22.8	7.103	-36.4
15	101	.3247	0.0000	.1516	.8789	.6072	.2709	-23.2	-31.7	-63.8	47.977	-98.5
15	102	.4546	0.0000	.2122	.2740	.3317	.6724	-63.9	-156.4	-179.8	57.174	-107.1
16	103	.5787	0.0000	.2702	.6719	.9036	.9979	-179.6	173.0	168.4	27.674	-124.0
16	104	.6972	0.0000	.3255	.9979	.9353	.7269	168.5	164.2	158.4	23.228	102.6
16	105	.8156	0.0000	.3808	.7274	.4154	.1692	158.6	145.8	74.7	54.777	81.9
17	106	.9471	0.0000	.4422	.1680	.5008	.8360	75.1	5.0	-5.6	51.610	72.8
17	107	1.0914	0.0000	.5095	.8350	.9785	.8896	-5.6	-10.8	-15.5	9.889	9.6
17	108	1.2358	0.0000	.5769	.8894	.5915	.1943	-15.4	-22.8	-58.9	47.547	-95.2
17	109	1.3802	0.0000	.6442	.1934	.3728	.7482	-58.5	-170.5	175.8	54.719	-104.5
17	110	1.5246	0.0000	.7115	.7479	.9544	.9319	175.7	170.6	166.7	14.144	-134.6
18	111	1.6642	0.0000	.7771	.9321	.7068	.3400	166.7	162.0	149.1	40.952	86.3
18	112	1.7991	0.0000	.8409	.3398	.1764	.5642	149.4	30.7	-1.2	58.194	77.8
18	113	1.9340	0.0000	.9047	.5643	.8634	.9821	-1.4	-7.4	-10.8	28.916	66.9
18	114	2.0689	0.0000	.9684	.9831	.8925	.6117	-10.8	-13.9	-18.7	25.662	-88.3
18	115	2.2038	0.0000	1.0322	.6128	.2133	.2897	-18.5	-38.5	-171.6	58.497	-100.0
18	116	2.3387	0.0000	1.0960	.2886	.6842	.9455	-172.1	175.2	171.7	44.703	-105.2
18	117	2.4736	0.0000	1.1597	.9486	1.0088	.8501	171.5	169.6	168.3	7.311	106.5
18	118	2.6084	0.0000	1.2235	.8684	.5063	.0000	168.1	167.1	166.2	57.666	78.1
		.0000	0.0000	.0000	GAP 10			GAP 10			68.884	89.7
19	119	-.0649	0.0000	-.0303	.2263	.6492	.9283	-40.4	-15.2	-14.5	50.424	83.3
19	120	-.1948	0.0000	-.0909	.9077	.9883	.8780	-16.5	-18.8	-22.8	7.103	-36.4
19	121	-.3247	0.0000	-.1516	.8789	.6072	.2709	-23.2	-31.7	-63.8	47.977	-98.5
19	122	-.4546	0.0000	-.2122	.2740	.3317	.6724	-63.9	-156.4	-179.8	57.174	-107.1
20	123	-.5787	0.0000	-.2702	.6719	.9036	.9979	-179.6	173.0	168.4	27.674	-124.0
20	124	-.6972	0.0000	-.3255	.9979	.9353	.7269	168.5	164.2	158.4	23.228	102.6
20	125	-.8156	0.0000	-.3808	.7274	.4154	.1692	158.6	145.8	74.7	54.777	81.9
21	126	-.9471	0.0000	-.4422	.1680	.5008	.8360	75.1	5.0	-5.6	51.610	72.8
21	127	1.0914	0.0000	-.5095	.8350	.9785	.8896	-5.6	-10.8	-15.5	9.889	9.6
21	128	1.2358	0.0000	-.5769	.8894	.5915	.1943	-15.4	-22.8	-58.9	47.547	-95.2
21	129	1.3802	0.0000	-.6442	.1934	.3728	.7482	-58.5	-170.5	175.8	54.719	-104.5
21	130	1.5246	0.0000	-.7115	.7479	.9544	.9319	175.7	170.6	166.7	14.144	-134.6
22	131	1.6642	0.0000	-.7771	.9321	.7068	.3400	166.7	162.0	149.1	40.952	86.3
22	132	1.7991	0.0000	-.8409	.3398	.1764	.5642	149.4	30.7	-1.2	58.194	77.8
22	133	1.9340	0.0000	-.9047	.5643	.8634	.9821	-1.4	-7.4	-10.8	28.916	66.9
22	134	2.0689	0.0000	-.9684	.9831	.8925	.6117	-10.8	-13.9	-18.7	25.662	-88.3
22	135	2.2038	0.0000	-1.0322	.6128	.2133	.2897	-18.5	-38.5	-171.6	58.497	-100.0
22	136	2.3387	0.0000	-1.0960	.2886	.6842	.9455	-172.1	175.2	171.7	44.703	-105.2
22	137	2.4736	0.0000	-1.1597	.9486	1.0088	.8501	171.5	169.6	168.3	7.311	106.5
22	138	2.6084	0.0000	-1.2235	.8684	.5063	.0000	168.1	167.1	166.2	57.666	78.1

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	266.032	-575.424	.000662	.001432	0.000	0.000	266.032	-575.424	1000.000	0.0
2	266.032	-575.424	.000662	.001432	0.000	0.000	266.032	-575.424	1000.000	0.0
3					INFINITE	INFINITE	-54.005	49.839	56.306	14.3
6					INFINITE	INFINITE	-54.005	49.839	56.306	14.3
9					INFINITE	INFINITE	-.000	2311.619	523.029	49.6
10					INFINITE	INFINITE	-.000	2311.619	523.029	49.6
4					INFINITE	INFINITE	-600.000	-.000	193.009	103.5
7					INFINITE	INFINITE	-600.000	-.000	193.009	103.5

INPUT POWER = 1323.918 WATTS
RADIATED POWER = 948.754 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 375.163 WATTS
RADIATION EFFICIENCY = 71.66 PER CENT

ANTENNA/SCATTERING PROGRAM WIRA

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TCI.2236 NASA SATELLITE ANT. SHORT V INTERPOLATION SCHEME 1

NUMBER OF WIRES 22
THE X-Z PLANE IS A MAGNETIC PLANE
WIRE CONDUCTIVITY INFINITE

WIRE COORDINATES IN FEET AND WIRE RADII IN INCHES.

WIRE NO			X1	Y1	Z1	RAD1		X2	Y2	Z2	RAD2	INTERVALS
1	GAP	1	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	61.5000	.250000	3
2	GAP	2	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	-61.5000	.250000	3
3	GAP	3	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	30.8000	.250000	3
4			-0.0000	53.2000	30.8000	.250000		-0.0000	89.6000	51.8000	.250000	1
5			-0.0000	89.6000	51.8000	.250000		-0.0000	163.7000	94.5000	.250000	1
6			-0.0000	163.7000	94.5000	.250000	GAP 4	-0.0000	228.5000	132.0000	.250000	1
7	GAP	5	-0.0000	228.5000	132.0000	.250000		-0.0000	293.6000	169.5000	.250000	1
8			-0.0000	293.6000	169.5000	.250000		-0.0000	391.0000	225.7000	.250000	1
9	GAP	6	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	-30.8000	.250000	3
10			-0.0000	53.2000	-30.8000	.250000		-0.0000	89.6000	-51.8000	.250000	1
11			-0.0000	89.6000	-51.8000	.250000		-0.0000	163.7000	-94.5000	.250000	1
12			-0.0000	163.7000	-94.5000	.250000	GAP 7	-0.0000	228.5000	-132.0000	.250000	1
13	GAP	8	-0.0000	228.5000	-132.0000	.250000		-0.0000	293.6000	-169.5000	.250000	1
14			-0.0000	293.6000	-169.5000	.250000		-0.0000	391.0000	-225.7000	.250000	1
15	GAP	9	-0.0000	-0.0000	-0.0000	.290000		55.7000	-0.0000	26.0000	.290000	3
16			55.7000	-0.0000	26.0000	.290000		93.8000	-0.0000	43.8000	.290000	1
17			93.8000	-0.0000	43.8000	.290000		171.2000	-0.0000	79.9000	.290000	1
18			171.2000	-0.0000	79.9000	.290000		244.5000	-0.0000	114.1000	.290000	1
19	GAP	10	-0.0000	-0.0000	-0.0000	.290000		-55.7000	-0.0000	-26.0000	.290000	3
20			-55.7000	-0.0000	-26.0000	.290000		-93.8000	-0.0000	-43.8000	.290000	1
21			-93.8000	-0.0000	-43.8000	.290000		-171.2000	-0.0000	-79.9000	.290000	1
22			-171.2000	-0.0000	-79.9000	.290000		-244.5000	-0.0000	-114.1000	.290000	1

FREQUENCY = .2020 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 305

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 17.7 PER CENT FOR GAPS 9 AND

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	*300000.0000	-0.0000	-0.0000	-0.0000
10	IMP	2- 0	*300000.0000	-0.0000	-0.0000	-0.0000
11	IMP	1- 2	*000000.0000	-0.0000	-0.0000	-0.0000

WIRE NO	INT NO	COORDINATES X WAVELENGTHS	Y WAVELENGTHS	Z WAVELENGTHS	CURRENT DISTRIBUTION AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	NORMAL ELECTRIC FIELD * RADIUS VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			185.663	-.0
1	1	0.0000	0.0000	.0021	.1903	.1519	.1188	90.0	90.0	90.0	162.319	-.0
1	2	0.0000	0.0000	.0063	.1211	.0907	.0610	90.0	90.0	90.0	136.271	-.0
1	3	0.0000	0.0000	.0105	.0621	.0319	.0000	90.0	90.0	-90.0	141.014	-.0
		0.0000	0.0000	0.0000	GAP 2			GAP 2			185.663	180.0
2	4	0.0000	0.0000	-.0021	.1903	.1519	.1188	-90.0	-90.0	-90.0	162.319	180.0
2	5	0.0000	0.0000	-.0063	.1211	.0907	.0610	-90.0	-90.0	-90.0	136.271	180.0

WIRE NO	INT NO	X WAVELENGTHS	Y WAVELENGTHS	Z WAVELENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
2	6	0.0000	0.0000	-.0105	.0621	.0319	.0000	-90.0	-90.0	90.0	141.014	180.0
		0.0000	-.0000	-.0000	GAP 3			GAP 3			20.135	178.8
3	7	0.0000	.0018	.0011	.0200	.0162	.0136	-99.5	-101.4	-103.3	14.594	178.6
3	8	0.0000	.0055	.0032	.0140	.0123	.0109	-102.9	-104.5	-106.1	7.326	177.8
3	9	0.0000	.0091	.0053	.0110	.0099	.0090	-105.9	-107.4	-108.9	4.698	176.8
4	10	0.0000	.0147	.0085	.0091	.0077	.0067	-108.6	-111.2	-113.6	2.760	174.7
5	11	0.0000	.0260	.0150	.0069	.0056	.0045	-112.7	-116.0	-119.3	1.349	169.4
6	12	0.0000	.0402	.0232	.0046	.0039	.0032	-118.6	-121.4	-124.8	.913	165.0
		0.0000	.0469	.0271			GAP 4			GAP 4	.819	164.0
		0.0000	.0469	.0271	GAP 5			GAP 5			.839	146.8
7	13	0.0000	.0536	.0309	.0032	.0025	.0019	-124.8	-125.2	-125.5	.814	146.2
8	14	0.0000	.0703	.0406	.0019	.0010	.0000	-125.5	-125.9	-20.6	.797	144.5
		0.0000	-.0000	.0000	GAP 6			GAP 6			20.135	-1.2
9	15	0.0000	.0018	-.0011	.0200	.0162	.0136	80.5	78.6	76.7	14.594	-1.4
9	16	0.0000	.0055	-.0032	.0140	.0123	.0109	77.1	75.5	73.9	7.326	-2.2
9	17	0.0000	.0091	-.0053	.0110	.0099	.0090	74.1	72.6	71.1	4.698	-3.2
10	18	0.0000	.0147	-.0085	.0091	.0077	.0067	71.4	68.8	66.4	2.760	-5.3
11	19	0.0000	.0260	-.0150	.0069	.0056	.0045	67.3	64.0	60.7	1.349	-10.6
12	20	0.0000	.0402	-.0232	.0046	.0039	.0032	61.4	58.6	55.2	.913	-15.0
		0.0000	.0469	-.0271			GAP 7			GAP 7	.819	-16.0
		0.0000	.0469	-.0271	GAP 8			GAP 8			.839	-33.2
13	21	0.0000	.0536	-.0309	.0032	.0025	.0019	55.2	54.8	54.5	.814	-33.8
14	22	0.0000	.0703	-.0406	.0019	.0010	.0000	54.5	54.1	159.4	.797	-35.5
		0.0000	0.0000	0.0000	GAP 9			GAP 9			14.282	-179.9
15	23	.0019	0.0000	.0009	.0121	.0094	.0075	-89.7	-89.7	-89.6	10.462	-179.9
15	24	.0057	0.0000	.0027	.0078	.0065	.0054	-89.7	-89.6	-89.6	5.362	-179.9
15	25	.0095	0.0000	.0044	.0055	.0047	.0040	-89.6	-89.5	-89.5	3.406	-179.8
16	26	.0153	0.0000	.0072	.0041	.0031	.0023	-89.5	-89.4	-89.3	1.951	-179.7
17	27	.0272	0.0000	.0127	.0025	.0016	.0009	-89.4	-89.3	-89.3	.887	-179.5
18	28	.0427	0.0000	.0199	.0010	.0005	.0000	-89.3	-89.3	90.7	.576	-179.3
		0.0000	0.0000	0.0000	GAP 10			GAP 10			14.282	.1
19	29	-.0019	0.0000	-.0009	.0121	.0094	.0075	90.3	90.3	90.4	10.462	.1
19	30	-.0057	0.0000	-.0027	.0078	.0065	.0054	90.3	90.4	90.4	5.362	.1
19	31	-.0095	0.0000	-.0044	.0055	.0047	.0040	90.4	90.5	90.5	3.406	.2
20	32	-.0153	0.0000	-.0072	.0041	.0031	.0023	90.5	90.6	90.7	1.951	.3
21	33	-.0272	0.0000	-.0127	.0025	.0016	.0009	90.6	90.7	90.7	.887	.5
22	34	-.0427	0.0000	-.0199	.0010	.0005	.0000	90.7	90.7	-89.3	.576	.7

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	2.565	-5255.555	.000000	.000190	0.000	0.000	1.610	-5255.556	1000.000	0.0
2	2.565	-5255.555	.000000	.000190	0.000	0.000	1.610	-5255.556	1000.000	-180.0
3					INFINITE	INFINITE	-99.959	2.030	1.995	79.4

	OHMS	OHMS	MHOS	MHOS	OHMS	OHMS	OHMS	OHMS	VOLT	DEGREES
6					INFINITE	INFINITE	-99.959	2.030	1.995	-100.6
9					INFINITE	INFINITE	.000	.000	.000	-81.1
10					INFINITE	INFINITE	-.000	-.000	.000	-81.1
4					INFINITE	INFINITE	-600.000	.000	1.927	-124.8
7					INFINITE	INFINITE	-600.000	.000	1.927	55.2

INPUT POWER = .186 WATTS
RADIATED POWER = -.067 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = .253 WATTS
RADIATION EFFICIENCY = -36.27 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

WIRE NO	INT NO	COORDINATES X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	CURRENT DISTRIBUTION AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	NORMAL ELECTRIC FIELD * RADIUS VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			162.773	-.6
1	1	0.0000	0.0000	.0021	.1756	.1416	.1115	89.3	89.2	89.2	145.321	-.7
1	2	0.0000	0.0000	.0063	.1133	.0853	.0575	89.2	89.2	89.2	126.537	-.7
1	3	0.0000	0.0000	.0105	.0585	.0301	.0000	89.2	89.2	-91.0	132.841	-.8
		0.0000	0.0000	0.0000	GAP 2			GAP 2			162.773	-.6
2	4	0.0000	0.0000	-.0021	.1756	.1416	.1115	89.3	89.2	89.2	145.321	-.7
2	5	0.0000	0.0000	-.0063	.1133	.0853	.0575	89.2	89.2	89.2	126.537	-.7
2	6	0.0000	0.0000	-.0105	.0585	.0301	.0000	89.2	89.2	-91.0	132.841	-.8

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
		0.0000	-.0000	-.0000	GAP 3			GAP 3			51.143	179.9
3	7	0.0000	.0018	.0011	.0874	.0776	.0709	-90.8	-90.9	-91.0	37.494	-179.8
3	8	0.0000	.0055	.0032	.0720	.0671	.0631	-91.0	-91.1	-91.3	20.028	-179.0
3	9	0.0000	.0091	.0053	.0634	.0600	.0570	-91.3	-91.4	-91.6	14.403	-178.3
4	10	0.0000	.0147	.0085	.0573	.0522	.0478	-91.6	-92.0	-92.5	10.489	-177.2
5	11	0.0000	.0260	.0150	.0483	.0411	.0347	-92.5	-93.6	-95.3	7.507	-175.4
6	12	0.0000	.0402	.0232	.0350	.0298	.0249	-95.2	-97.2	-100.2	6.471	-173.1
		0.0000	.0469	.0271		GAP 4				GAP 4	6.247	-171.8
		0.0000	.0469	.0271	GAP 5			GAP 5			6.152	168.0
7	13	0.0000	.0536	.0309	.0249	.0199	.0150	-100.2	-99.8	-99.6	6.114	168.9
8	14	0.0000	.0703	.0406	.0151	.0077	.0000	-99.8	-99.7	87.5	6.274	170.2
		0.0000	-.0000	.0000	GAP 6			GAP 6			51.143	179.9
9	15	0.0000	.0018	-.0011	.0874	.0776	.0709	-90.8	-90.9	-91.0	37.494	-179.8
9	16	0.0000	.0055	-.0032	.0720	.0671	.0631	-91.0	-91.1	-91.3	20.028	-179.0
9	17	0.0000	.0091	-.0053	.0634	.0600	.0570	-91.3	-91.4	-91.6	14.403	-178.3
10	18	0.0000	.0147	-.0085	.0573	.0522	.0478	-91.6	-92.0	-92.5	10.489	-177.2
11	19	0.0000	.0260	-.0150	.0483	.0411	.0347	-92.5	-93.6	-95.3	7.507	-175.4
12	20	0.0000	.0402	-.0232	.0350	.0298	.0249	-95.2	-97.2	-100.2	6.471	-173.1
		0.0000	.0469	-.0271		GAP 7				GAP 7	6.247	-171.8
		0.0000	.0469	-.0271	GAP 8			GAP 8			6.152	168.0
13	21	0.0000	.0536	-.0309	.0249	.0199	.0150	-100.2	-99.8	-99.6	6.114	168.9
14	22	0.0000	.0703	-.0406	.0151	.0077	.0000	-99.8	-99.7	87.5	6.274	170.2
		0.0000	0.0000	0.0000	GAP 9			GAP 9			34.560	178.4
15	23	.0019	0.0000	.0009	.0008	.0055	.0093	-81.5	86.9	87.4	22.943	178.4
15	24	.0057	0.0000	.0027	.0084	.0105	.0119	87.3	87.5	87.6	8.019	178.2
15	25	.0095	0.0000	.0044	.0117	.0126	.0131	87.6	87.6	87.6	3.160	178.0
16	26	.0153	0.0000	.0072	.0129	.0131	.0127	87.6	87.6	87.6	.199	.0
17	27	.0272	0.0000	.0127	.0123	.0101	.0072	87.6	87.5	87.4	2.807	-2.2
18	28	.0427	0.0000	.0199	.0070	.0037	.0000	87.4	87.3	86.3	4.051	-2.6
		0.0000	0.0000	0.0000	GAP 10			GAP 10			34.560	178.4
19	29	-.0019	0.0000	-.0009	.0008	.0055	.0093	-81.5	86.9	87.4	22.943	178.4
19	30	-.0057	0.0000	-.0027	.0084	.0105	.0119	87.3	87.5	87.6	8.019	178.2
19	31	-.0095	0.0000	-.0044	.0117	.0126	.0131	87.6	87.6	87.6	3.160	178.0
20	32	-.0153	0.0000	-.0072	.0129	.0131	.0127	87.6	87.6	87.6	.199	.0
21	33	-.0272	0.0000	-.0127	.0123	.0101	.0072	87.6	87.5	87.4	2.807	-2.2
22	34	-.0427	0.0000	-.0199	.0070	.0037	.0000	87.4	87.3	86.3	4.051	-2.6

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IMPEDANCE DATA

GAP NO.	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	73.630	-5696.697	.000002	.000176	0.000	0.000	72.913	-5696.715	1000.000	0.0
2	73.630	-5696.697	.000002	.000176	0.000	0.000	72.913	-5696.715	1000.000	0.0
3					INFINITE	INFINITE	-99.959	2.030	8.735	88.1
6					INFINITE	INFINITE	-99.959	2.030	8.735	88.1

	OHMS	OHMS	MHOS	MHOS	OHMS	OHMS	OHMS	OHMS	VOLT	DEGREES
9					INFINITE	INFINITE	-.000	105052.768	84.238	8.9
10					INFINITE	INFINITE	-.000	105052.768	84.238	8.9
4					INFINITE	INFINITE	-600.000	0.000	14.919	-100.2
7					INFINITE	INFINITE	-600.000	-.000	14.919	-100.2

INPUT POWER = 4.537 WATTS
RADIATED POWER = -.043 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 4.580 WATTS
RADIATION EFFICIENCY = -.95 PER CENT

FREQUENCY = .3110 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 306

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 16.0 PER CENT FOR GAPS 9 AND 3

EXCITATION MODE

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9-10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	*600000.0000	-0.0000	-0.0000	-0.0000
10	IMP	2- 0	*600000.0000	-0.0000	-0.0000	-0.0000
11	IMP	1- 2	*700000.0000	-0.0000	-0.0000	-0.0000

WIRE NO	INT NO	COORDINATES X WAVELENGTHS	Y WAVELENGTHS	Z WAVELENGTHS	CURRENT DISTRIBUTION AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	NORMAL ELECTRIC FIELD * RADIUS VOLTS	DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1			185.648	-.0
1	1	0.0000	0.0000	.0032	.2938	.2347	.1836	90.0	90.0	90.0	162.484	-.0
1	2	0.0000	0.0000	.0097	.1871	.1403	.0943	90.0	90.0	90.0	136.701	-.0
1	3	0.0000	0.0000	.0162	.0961	.0493	.0000	90.0	90.0	-90.0	141.635	-.0
		0.0000	0.0000	.0000	GAP 2			GAP 2			185.648	180.0
2	4	0.0000	0.0000	-.0032	.2938	.2347	.1836	-90.0	-90.0	-90.0	162.484	180.0
2	5	0.0000	0.0000	-.0097	.1871	.1403	.0943	-90.0	-90.0	-90.0	136.701	180.0
2	6	0.0000	0.0000	-.0162	.0961	.0493	.0000	-90.0	-90.0	90.0	141.635	180.0
		0.0000	-.0000	-.0000	GAP 3			GAP 3			20.036	178.3
3	7	0.0000	.0028	.0016	.0297	.0241	.0203	-106.1	-109.5	-112.9	14.512	178.0
3	8	0.0000	.0084	.0049	.0209	.0183	.0163	-112.2	-115.0	-117.8	7.263	176.7
3	9	0.0000	.0140	.0081	.0164	.0149	.0136	-117.6	-120.2	-122.7	4.645	175.0
4	10	0.0000	.0226	.0130	.0138	.0118	.0104	-122.3	-126.6	-130.7	2.723	171.4
5	11	0.0000	.0400	.0231	.0107	.0088	.0073	-129.2	-134.7	-140.0	1.353	161.5
6	12	0.0000	.0620	.0358	.0074	.0062	.0052	-138.9	-143.3	-148.6	.972	152.5
		0.0000	.0722	.0417			GAP 4			GAP 4	.900	149.9
		0.0000	.0722	.0417	GAP 5			GAP 5			.837	124.1
7	13	0.0000	.0825	.0476	.0052	.0042	.0031	-148.6	-149.2	-149.7	.834	123.0
8	14	0.0000	.1082	.0624	.0032	.0016	.0000	-149.6	-150.3	-4.8	.856	120.4
		0.0000	-.0000	.0000	GAP 6			GAP 6			20.036	-1.7
9	15	0.0000	.0028	-.0016	.0297	.0241	.0203	73.9	70.5	67.1	14.512	-2.0
9	16	0.0000	.0084	-.0049	.0209	.0183	.0163	67.8	65.0	62.2	7.263	-3.3
9	17	0.0000	.0140	-.0081	.0164	.0149	.0136	62.4	59.8	57.3	4.645	-5.0
10	18	0.0000	.0226	-.0130	.0138	.0118	.0104	57.7	53.4	49.3	2.723	-8.6
11	19	0.0000	.0400	-.0231	.0107	.0088	.0073	50.8	45.3	40.0	1.353	-18.5
12	20	0.0000	.0620	-.0358	.0074	.0062	.0052	41.1	36.7	31.4	.972	-27.5
		0.0000	.0722	-.0417			GAP 7			GAP 7	.900	-30.1
		0.0000	.0722	-.0417	GAP 8			GAP 8			.837	-55.9
13	21	0.0000	.0825	-.0476	.0052	.0042	.0031	31.4	30.8	30.3	.834	-57.0
14	22	0.0000	.1082	-.0624	.0032	.0016	.0000	30.4	29.7	175.2	.856	-59.6
		0.0000	0.0000	0.0000	GAP 9			GAP 9			14.294	-179.9
15	23	.0029	0.0000	.0014	.0187	.0145	.0116	-89.6	-89.6	-89.5	10.474	-179.8
15	24	.0088	0.0000	.0041	.0120	.0100	.0084	-89.5	-89.5	-89.4	5.370	-179.8
15	25	.0147	0.0000	.0068	.0085	.0072	.0062	-89.4	-89.3	-89.3	3.413	-179.7
16	26	.0236	0.0000	.0110	.0063	.0048	.0036	-89.3	-89.2	-89.1	1.957	-179.6

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
17	27	.0419	0.0000	.0195	.0039	.0025	.0014	-89.2	-89.1	-89.0	.894	-179.2
18	28	.0657	0.0000	.0306	.0016	.0007	.0000	-89.1	-89.1	-88.7	.582	-179.1
		0.0000	0.0000	0.0000	GAP 10			GAP 10			14.294	.1
19	29	-.0029	0.0000	-.0014	.0187	.0145	.0116	90.4	90.4	90.5	10.474	.2
19	30	-.0088	0.0000	-.0041	.0120	.0100	.0084	90.5	90.5	90.6	5.370	.2
19	31	-.0147	0.0000	-.0068	.0085	.0072	.0062	90.6	90.7	90.7	3.413	.3
20	32	-.0236	0.0000	-.0110	.0063	.0048	.0036	90.7	90.8	90.9	1.957	.4
21	33	-.0419	0.0000	-.0195	.0039	.0025	.0014	90.8	90.9	91.0	.894	.8
22	34	-.0657	0.0000	-.0306	.0016	.0007	.0000	90.9	90.9	91.3	.582	.9

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	DEGREES
1	2.492	-3404.243	.000000	.000294	0.000	0.000	1.480	-3404.244	1000.000	0.0
2	2.492	-3404.243	.000000	.000294	0.000	0.000	1.480	-3404.244	1000.000	-180.0
3					INFINITE	INFINITE	-99.902	3.123	2.969	72.1
6					INFINITE	INFINITE	-99.902	3.123	2.969	-107.9
9					INFINITE	INFINITE	.000	.000	.000	-74.5
10					INFINITE	INFINITE	-.000	-.000	.000	-74.5
4					INFINITE	INFINITE	-600.000	.000	3.128	-148.6
7					INFINITE	INFINITE	-600.000	.000	3.128	31.4

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INPUT POWER = .430 WATTS
RADIATED POWER = -.162 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = .593 WATTS
RADIATION EFFICIENCY = -37.76 PER CENT

EXCITATION MODE

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

WIRE NO.	INT NO.	COORDINATES X WAVE-LENGTHS	COORDINATES Y WAVE-LENGTHS	COORDINATES Z WAVE-LENGTHS	CURRENT DISTRIBUTION AMPLITUDE AMP	AMP	AMP	CURRENT DISTRIBUTION PHASE DEG	DEG	DEG	NORMAL ELECTRIC FIELD * RADIUS VOLTS	DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1			163.257	-1.0
1	1	0.0000	0.0000	.0032	.2722	.2198	.1732	88.8	88.8	88.8	146.007	-1.1
1	2	0.0000	0.0000	.0097	.1759	.1325	.0894	88.8	88.8	88.8	127.535	-1.2
1	3	0.0000	0.0000	.0162	.0910	.0468	.0000	88.8	88.7	-91.6	134.102	-1.2
		0.0000	0.0000	.0000	GAP 2			GAP 2			163.257	-1.0
2	4	0.0000	0.0000	-.0032	.2722	.2198	.1732	88.8	88.8	88.8	146.007	-1.1
2	5	0.0000	0.0000	-.0097	.1759	.1325	.0894	88.8	88.8	88.8	127.535	-1.2
2	6	0.0000	0.0000	-.0162	.0910	.0468	.0000	88.8	88.7	-91.6	134.102	-1.2
		0.0000	-.0000	-.0000	GAP 3			GAP 3			50.622	180.0
3	7	0.0000	.0028	.0016	.1356	.1207	.1105	-91.2	-91.4	-91.6	37.001	-179.6
3	8	0.0000	.0084	.0049	.1122	.1049	.0989	-91.6	-91.8	-92.1	19.601	-178.2
3	9	0.0000	.0140	.0081	.0992	.0942	.0897	-92.1	-92.3	-92.6	14.066	-176.9
4	10	0.0000	.0226	.0130	.0901	.0825	.0759	-92.6	-93.3	-94.0	10.304	-175.1
5	11	0.0000	.0400	.0231	.0768	.0658	.0558	-94.0	-95.9	-98.4	7.618	-172.4
6	12	0.0000	.0620	.0358	.0562	.0481	.0403	-98.3	-101.4	-106.0	6.927	-169.8
		0.0000	.0722	.0417			GAP 4			GAP 4	6.851	-168.3
		0.0000	.0722	.0417	GAP 5			GAP 5			6.295	161.1
7	13	0.0000	.0825	.0476	.0403	.0325	.0246	-106.0	-105.5	-105.1	6.352	162.6
8	14	0.0000	.1082	.0624	.0248	.0127	.0000	-105.4	-105.3	80.0	6.684	164.6
		0.0000	-.0000	-.0000	GAP 6			GAP 6			50.622	180.0
9	15	0.0000	.0028	-.0016	.1356	.1207	.1105	-91.2	-91.4	-91.6	37.001	-179.6
9	16	0.0000	.0084	-.0049	.1122	.1049	.0989	-91.6	-91.8	-92.1	19.601	-178.2
9	17	0.0000	.0140	-.0081	.0992	.0942	.0897	-92.1	-92.3	-92.6	14.066	-176.9
10	18	0.0000	.0226	-.0130	.0901	.0825	.0759	-92.6	-93.3	-94.0	10.304	-175.1
11	19	0.0000	.0400	-.0231	.0768	.0658	.0558	-94.0	-95.9	-98.4	7.618	-172.4
12	20	0.0000	.0620	-.0358	.0562	.0481	.0403	-98.3	-101.4	-106.0	6.927	-169.8
		0.0000	.0722	-.0417			GAP 7			GAP 7	6.851	-168.3
		0.0000	.0722	-.0417	GAP 8			GAP 8			6.295	161.1
13	21	0.0000	.0825	-.0476	.0403	.0325	.0246	-106.0	-105.5	-105.1	6.352	162.6
14	22	0.0000	.1082	-.0624	.0248	.0127	.0000	-105.4	-105.3	80.0	6.684	164.6
		0.0000	0.0000	0.0000	GAP 9			GAP 9			35.573	177.3
15	23	.0029	0.0000	.0014	.0012	.0089	.0149	-74.6	85.0	85.9	23.670	177.3
15	24	.0088	0.0000	.0041	.0135	.0169	.0192	85.7	86.0	86.1	8.363	177.0
15	25	.0147	0.0000	.0068	.0189	.0203	.0211	86.1	86.1	86.2	3.357	176.7
16	26	.0236	0.0000	.0110	.0208	.0212	.0206	86.1	86.1	86.1	.140	3.0
17	27	.0419	0.0000	.0195	.0200	.0165	.0117	86.0	85.9	85.8	2.922	-3.6
18	28	.0657	0.0000	.0306	.0115	.0061	.0000	85.8	85.7	-95.9	4.303	-4.2
		0.0000	0.0000	0.0000	GAP 10			GAP 10			35.573	177.3

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
19	29	-.0029	0.0000	-.0014	.0012	.0089	.0149	-74.6	85.0	85.9	23.670	177.3
19	30	-.0088	0.0000	-.0041	.0135	.0169	.0192	85.7	86.0	86.1	8.363	177.0
19	31	-.0147	0.0000	-.0068	.0189	.0203	.0211	86.1	86.1	86.2	3.357	176.7
20	32	-.0236	0.0000	-.0110	.0208	.0212	.0206	86.1	86.1	86.1	.140	3.0
21	33	-.0419	0.0000	-.0195	.0200	.0165	.0117	86.0	85.9	85.8	2.922	-3.6
22	34	-.0657	0.0000	-.0306	.0115	.0061	.0000	85.8	85.7	-95.9	4.303	-4.2

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	DEGREES
1	75.943	-3672.793	.000006	.000272	0.000	0.000	75.131	-3672.826	1000.000	0.0
2	75.943	-3672.793	.000006	.000272	0.000	0.000	75.131	-3672.826	1000.000	0.0
3					INFINITE	INFINITE	-99.902	3.123	13.548	87.0
6					INFINITE	INFINITE	-99.902	3.123	13.548	87.0
9					INFINITE	INFINITE	-.000	68233.630	79.297	15.5
10					INFINITE	INFINITE	-.000	68233.630	79.297	15.5
4					INFINITE	INFINITE	-600.000	.000	24.204	-106.0
7					INFINITE	INFINITE	-600.000	-.000	24.204	-106.0

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INPUT POWER = 11.255 WATTS
RADIATED POWER = -.114 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 11.368 WATTS
RADIATION EFFICIENCY = -1.01 PER CENT

QUENCY = .3690 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO.

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 14.4 PER CENT FOR GAPS. 9 AND 3

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	*800000.0000	-0.0000	-0.0000	-0.0000
10	IMP	2- 0	*800000.0000	-0.0000	-0.0000	-0.0000
11	IMP	1- 2	*900000.0000	-0.0000	-0.0000	-0.0000

		COORDINATES			CURRENT DISTRIBUTION						NORMAL ELECTRIC FIELD * RADIUS	
		X	Y	Z	AMPLITUDE			PHASE				
WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			185.639	-.0
1	1	0.0000	0.0000	.0038	.3492	.2791	.2183	90.0	90.0	90.0	162.601	-.0
1	2	0.0000	0.0000	.0115	.2225	.1669	.1123	90.0	90.0	90.0	137.006	-.0
1	3	0.0000	0.0000	.0192	.1143	.0587	.0000	90.0	90.0	90.0	142.077	-.0
		0.0000	0.0000	0.0000	GAP 2			GAP 2			185.639	180.0
2	4	0.0000	0.0000	-.0038	.3492	.2791	.2183	-90.0	-90.0	-90.0	162.601	180.0
2	5	0.0000	0.0000	-.0115	.2225	.1669	.1123	-90.0	-90.0	-90.0	137.006	180.0

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
2	6	0.0000	0.0000	-.0192	.1143	.0587	.0000	-90.0	-90.0	-90.0	142.077	180.0
		0.0000	-.0000	-.0000	GAP 3			GAP 3			19.968	178.1
3	7	0.0000	.0033	.0019	.0338	.0273	.0230	-110.1	-114.6	-119.0	14.453	177.8
3	8	0.0000	.0100	.0058	.0237	.0208	.0186	-118.2	-121.9	-125.6	7.213	176.2
3	9	0.0000	.0166	.0096	.0187	.0170	.0156	-125.3	-128.7	-132.0	4.596	174.1
4	10	0.0000	.0268	.0155	.0158	.0137	.0122	-131.4	-137.1	-142.2	2.680	169.5
5	11	0.0000	.0475	.0274	.0125	.0104	.0087	-140.4	-147.3	-153.6	1.336	156.2
6	12	0.0000	.0735	.0425	.0088	.0075	.0063	-152.4	-157.7	-164.0	.998	143.4
		0.0000	.0857	.0495		GAP 4				GAP 4	.945	139.5
		0.0000	.0857	.0495	GAP 5			GAP 5			.816	109.4
7	13	0.0000	.0979	.0565	.0063	.0051	.0039	-164.0	-164.7	-165.3	.832	107.9
8	14	0.0000	.1283	.0741	.0039	.0020	.0000	-165.3	-166.1	-12.1	.886	104.7
		0.0000	-.0000	.0000	GAP 6			GAP 6			19.968	-1.9
9	15	0.0000	.0033	-.0019	.0338	.0273	.0230	69.9	65.4	61.0	14.453	-2.2
9	16	0.0000	.0100	-.0058	.0237	.0208	.0186	61.8	58.1	54.4	7.213	-3.8
9	17	0.0000	.0166	-.0096	.0187	.0170	.0156	54.7	51.3	48.0	4.596	-5.9
10	18	0.0000	.0268	-.0155	.0158	.0137	.0122	48.6	42.9	37.8	2.680	-10.5
11	19	0.0000	.0475	-.0274	.0125	.0104	.0087	39.6	32.7	26.4	1.336	-23.8
12	20	0.0000	.0735	-.0425	.0088	.0075	.0063	27.6	22.3	16.0	.998	-36.6
		0.0000	.0857	-.0495		GAP 7				GAP 7	.945	-40.5
		0.0000	.0857	-.0495	GAP 8			GAP 8			.816	-70.6
13	21	0.0000	.0979	-.0565	.0063	.0051	.0039	16.0	15.3	14.7	.832	-72.1
14	22	0.0000	.1283	-.0741	.0039	.0020	.0000	14.7	13.9	167.9	.886	-75.3
		0.0000	0.0000	0.0000	GAP 9			GAP 9			14.303	-179.8
15	23	.0035	0.0000	.0016	.0222	.0172	.0138	-89.6	-89.6	-89.5	10.482	-179.8
15	24	.0104	0.0000	.0049	.0143	.0119	.0100	-89.5	-89.4	-89.4	5.375	-179.8
15	25	.0174	0.0000	.0081	.0101	.0086	.0073	-89.4	-89.3	-89.3	3.417	-179.7
16	26	.0280	0.0000	.0131	.0075	.0057	.0043	-89.3	-89.2	-89.1	1.960	-179.5
17	27	.0497	0.0000	.0232	.0047	.0029	.0017	-89.2	-89.1	-89.1	.895	-179.2
18	28	.0779	0.0000	.0364	.0018	.0009	.0000	-89.1	-89.1	-88.7	.582	-179.1
		0.0000	0.0000	0.0000	GAP 10			GAP 10			14.303	.2
19	29	-.0035	0.0000	-.0016	.0222	.0172	.0138	90.4	90.4	90.5	10.482	.2
19	30	-.0104	0.0000	-.0049	.0143	.0119	.0100	90.5	90.6	90.6	5.375	.2
19	31	-.0174	0.0000	-.0081	.0101	.0086	.0073	90.6	90.7	90.7	3.417	.3
20	32	-.0280	0.0000	-.0131	.0075	.0057	.0043	90.7	90.8	90.9	1.960	.5
21	33	-.0497	0.0000	-.0232	.0047	.0029	.0017	90.8	90.9	90.9	.895	.8
22	34	-.0779	0.0000	-.0364	.0018	.0009	.0000	90.9	90.9	91.3	.582	.9

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	2.383	-2863.594	.000000	.000349	0.000	0.000	1.367	-2863.596	1000.000	0.0
2	2.383	-2863.594	.000000	.000349	0.000	0.000	1.367	-2863.596	1000.000	-180.0
3					INFINITE	INFINITE	-99.863	3.704	3.379	67.8

	OHMS	OHMS	MHOS	MHOS	OHMS	OHMS	OHMS	OHMS	VOLT	DEGREES
6					INFINITE	INFINITE	-99.863	3.704	3.379	-112.2
9					INFINITE	INFINITE	.000	.000	.000	-69.9
10					INFINITE	INFINITE	-.000	-.000	.000	-69.9
4					INFINITE	INFINITE	-600.000	.000	3.788	-164.0
7					INFINITE	INFINITE	-600.000	-.000	3.788	16.0

INPUT POWER = .581 WATTS
RADIATED POWER = -.219 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = .800 WATTS
RADIATION EFFICIENCY = -37.66 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

WIRE NO	INT NO	COORDINATES X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	CURRENT DISTRIBUTION AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	NORMAL ELECTRIC FIELD * RADIUS VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			163.612	-1.2
1	1	0.0000	0.0000	.0038	.3247	.2623	.2068	88.6	88.5	88.5	146.505	-1.3
1	2	0.0000	0.0000	.0115	.2100	.1582	.1068	88.5	88.5	88.5	128.255	-1.5
1	3	0.0000	0.0000	.0192	.1087	.0559	.0000	88.5	88.5	88.0	135.013	-1.5
		0.0000	0.0000	0.0000	GAP 2			GAP 2			163.612	-1.2
2	4	0.0000	0.0000	-.0038	.3247	.2623	.2068	88.6	88.5	88.5	146.505	-1.3
2	5	0.0000	0.0000	-.0115	.2100	.1582	.1068	88.5	88.5	88.5	128.255	-1.5
2	6	0.0000	0.0000	-.0192	.1087	.0559	.0000	88.5	88.5	88.0	135.013	-1.5

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
		0.0000	-.0000	-.0000	GAP 3			GAP 3			50.242	-180.0
3	7	0.0000	.0033	.0019	.1617	.1443	.1323	-91.5	-91.7	-92.0	36.640	-179.4
3	8	0.0000	.0100	.0058	.1343	.1258	.1188	-92.0	-92.2	-92.5	19.290	-177.6
3	9	0.0000	.0166	.0096	.1192	.1133	.1082	-92.5	-92.9	-93.2	13.824	-175.9
4	10	0.0000	.0268	.0155	.1086	.0998	.0921	-93.2	-94.0	-95.0	10.175	-173.6
5	11	0.0000	.0475	.0274	.0931	.0802	.0684	-94.9	-97.2	-100.3	7.710	-170.6
6	12	0.0000	.0735	.0425	.0688	.0591	.0497	-100.1	-103.9	-109.3	7.273	-168.2
		0.0000	.0857	.0495		GAP 4				GAP 4	7.303	-166.8
		0.0000	.0857	.0495	GAP 5			GAP 5			6.396	157.1
7	13	0.0000	.0979	.0565	.0497	.0402	.0305	-109.3	-108.7	-108.3	6.526	158.9
8	14	0.0000	.1283	.0741	.0308	.0158	.0000	-108.6	-108.5	75.9	6.994	161.4
		0.0000	-.0000	.0000	GAP 6			GAP 6			50.242	-180.0
9	15	0.0000	.0033	-.0019	.1617	.1443	.1323	-91.5	-91.7	-92.0	36.640	-179.4
9	16	0.0000	.0100	-.0058	.1343	.1258	.1188	-92.0	-92.2	-92.5	19.290	-177.6
9	17	0.0000	.0166	-.0096	.1192	.1133	.1082	-92.5	-92.9	-93.2	13.824	-175.9
10	18	0.0000	.0268	-.0155	.1086	.0998	.0921	-93.2	-94.0	-95.0	10.175	-173.6
11	19	0.0000	.0475	-.0274	.0931	.0802	.0684	-94.9	-97.2	-100.3	7.710	-170.6
12	20	0.0000	.0735	-.0425	.0688	.0591	.0497	-100.1	-103.9	-109.3	7.273	-168.2
		0.0000	.0857	-.0495		GAP 7				GAP 7	7.303	-166.8
		0.0000	.0857	-.0495	GAP 8			GAP 8			6.396	157.1
13	21	0.0000	.0979	-.0565	.0497	.0402	.0305	-109.3	-108.7	-108.3	6.526	158.9
14	22	0.0000	.1283	-.0741	.0308	.0158	.0000	-108.6	-108.5	75.9	6.994	161.4
		0.0000	0.0000	0.0000	GAP 9			GAP 9			36.324	176.7
15	23	.0035	0.0000	.0016	.0013	.0110	.0183	-69.7	83.9	85.0	24.209	176.6
15	24	.0104	0.0000	.0049	.0165	.0207	.0235	84.8	85.1	85.2	8.620	176.3
15	25	.0174	0.0000	.0081	.0231	.0248	.0259	85.2	85.3	85.3	3.507	175.8
16	26	.0280	0.0000	.0131	.0255	.0260	.0254	85.2	85.2	85.2	.095	9.7
17	27	.0497	0.0000	.0232	.0246	.0203	.0145	85.1	84.9	84.8	3.008	-4.4
18	28	.0779	0.0000	.0364	.0142	.0076	.0000	84.8	84.7	-97.2	4.493	-5.2
		0.0000	0.0000	0.0000	GAP 10			GAP 10			36.324	176.7
19	29	-.0035	0.0000	-.0016	.0013	.0110	.0183	-69.7	83.9	85.0	24.209	176.6
19	30	-.0104	0.0000	-.0049	.0165	.0207	.0235	84.8	85.1	85.2	8.620	176.3
19	31	-.0174	0.0000	-.0081	.0231	.0248	.0259	85.2	85.3	85.3	3.507	175.8
20	32	-.0280	0.0000	-.0131	.0255	.0260	.0254	85.2	85.2	85.2	.095	9.7
21	33	-.0497	0.0000	-.0232	.0246	.0203	.0145	85.1	84.9	84.8	3.008	-4.4
22	34	-.0779	0.0000	-.0364	.0142	.0076	.0000	84.8	84.7	-97.2	4.493	-5.2

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	77.736	-3079.017	.000008	.000325	0.000	0.000	76.859	-3079.061	1000.000	0.0
2	77.736	-3079.017	.000008	.000325	0.000	0.000	76.859	-3079.061	1000.000	0.0
3					INFINITE	INFINITE	-99.863	3.704	16.161	86.4
6					INFINITE	INFINITE	-99.863	3.704	16.161	86.4

	OHMS	OHMS	MHOS	MHOS	OHMS	OHMS	OHMS	OHMS	VOLT	DEGREES
9					INFINITE	INFINITE	-.000	57508.561	76.056	20.1
0					INFINITE	INFINITE	-.000	57508.561	76.056	20.1
4					INFINITE	INFINITE	-600.000	-.000	29.814	-109.3
7					INFINITE	INFINITE	-600.000	-.000	29.814	-109.3

INPUT POWER = 16.389 WATTS
RADIATED POWER = -.169 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 16.558 WATTS
RADIATION EFFICIENCY = -1.03 PER CENT

FREQUENCY = .4500 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 308

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 11.3 PER CENT FOR GAPS 9 AND 6

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	6160000.0000	-0.0000	-0.0000	-0.0000
10	IMP	2- 0	6160000.0000	-0.0000	-0.0000	-0.0000
11	IMP	1- 2	*000000.0000	-0.0000	-0.0000	-0.0000

WIRE NO	INT NO	COORDINATES X WAVELENGTHS	COORDINATES Y WAVELENGTHS	COORDINATES Z WAVELENGTHS	CURRENT DISTRIBUTION AMPLITUDE AMP	AMPLITUDE AMP	AMPLITUDE AMP	PHASE DEG	PHASE DEG	PHASE DEG	NORMAL ELECTRIC FIELD * RADIUS VOLTS	DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1			185.628	-.0
1	1	0.0000	0.0000	.0047	.4273	.3418	.2675	90.0	90.0	90.0	162.804	-.0
1	2	0.0000	0.0000	.0141	.2726	.2045	.1376	90.0	90.0	90.0	137.529	-.0
1	3	0.0000	0.0000	.0234	.1402	.0720	.0000	90.0	90.0	-90.0	142.834	-.0
		0.0000	0.0000	.0000	GAP 2			GAP 2			185.628	180.0
2	4	0.0000	0.0000	-.0047	.4273	.3418	.2675	-90.0	-90.0	-90.0	162.804	180.0
2	5	0.0000	0.0000	-.0141	.2726	.2045	.1376	-90.0	-90.0	-90.0	137.529	180.0
2	6	0.0000	0.0000	-.0234	.1402	.0720	.0000	-90.0	-90.0	90.0	142.834	180.0
		0.0000	0.0000	0.0000	GAP 3			GAP 3			19.886	178.1
3	7	0.0000	.0041	.0023	.0370	.0294	.0246	-115.4	-121.9	-128.4	14.374	177.6
3	8	0.0000	.0122	.0070	.0254	.0222	.0199	-127.1	-132.7	-138.1	7.130	175.8
3	9	0.0000	.0203	.0117	.0200	.0183	.0169	-137.7	-142.8	-147.5	4.504	173.2
4	10	0.0000	.0326	.0189	.0171	.0151	.0138	-146.8	-154.8	-161.9	2.580	167.0
5	11	0.0000	.0579	.0334	.0140	.0120	.0104	-159.5	-168.7	-176.8	1.258	147.5
6	12	0.0000	.0897	.0518	.0104	.0090	.0076	-175.4	178.0	170.1	.995	127.0
		0.0000	.1045	.0604			GAP 4			GAP 4	.978	120.7
		0.0000	.1045	.0604	GAP 5			GAP 5			.737	84.6
7	13	0.0000	.1194	.0689	.0076	.0063	.0048	170.1	169.4	168.7	.787	82.6
8	14	0.0000	.1565	.0903	.0048	.0025	.0000	168.7	167.7	-153.5	.902	78.7
		0.0000	0.0000	0.0000	GAP 6			GAP 6			19.886	-1.9
9	15	0.0000	.0041	-.0023	.0370	.0294	.0246	64.6	58.1	51.6	14.374	-2.4
9	16	0.0000	.0122	-.0070	.0254	.0222	.0199	52.9	47.3	41.9	7.130	-4.2
9	17	0.0000	.0203	-.0117	.0200	.0183	.0169	42.3	37.2	32.5	4.504	-6.8
10	18	0.0000	.0326	-.0189	.0171	.0151	.0138	33.2	25.2	18.1	2.580	-13.0
11	19	0.0000	.0579	-.0334	.0140	.0120	.0104	20.5	11.3	3.2	1.258	-32.5
12	20	0.0000	.0897	-.0518	.0104	.0090	.0076	4.6	-2.0	-9.9	.995	-53.0
		0.0000	.1045	-.0604			GAP 7			GAP 7	.978	-59.3
		0.0000	.1045	-.0604	GAP 8			GAP 8			.737	-95.4
13	21	0.0000	.1194	-.0689	.0076	.0063	.0048	-9.9	-10.6	-11.3	.787	-97.4
14	22	0.0000	.1565	-.0903	.0048	.0025	.0000	-11.3	-12.3	26.5	.902	-101.3
		0.0000	0.0000	0.0000	GAP 9			GAP 9			14.317	-179.8
15	23	.0042	0.0000	.0020	.0270	.0209	.0167	-89.5	-89.4	-89.3	10.493	-179.8
15	24	.0127	0.0000	.0059	.0174	.0144	.0121	-89.4	-89.3	-89.2	5.381	-179.8
15	25	.0212	0.0000	.0099	.0122	.0104	.0089	-89.2	-89.1	-89.0	3.419	-179.7
16	26	.0342	0.0000	.0160	.0091	.0068	.0051	-89.0	-88.9	-88.7	1.958	-179.5

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
17	27	.0606	0.0000	.0283	.0056	.0035	.0020	-88.8	-88.6	-88.4	.889	-179.0
18	28	.0950	0.0000	.0443	.0022	.0010	.0000	-88.5	-88.4	88.3	.569	-178.5
		0.0000	0.0000	0.0000	GAP 10			GAP 10			14.317	.2
19	29	-.0042	0.0000	-.0020	.0270	.0209	.0167	-90.5	90.6	90.7	10.493	.2
19	30	-.0127	0.0000	-.0059	.0174	.0144	.0121	90.6	90.7	90.8	5.381	.2
19	31	-.0212	0.0000	-.0099	.0122	.0104	.0089	90.8	90.9	91.0	3.419	.3
20	32	-.0342	0.0000	-.0160	.0091	.0068	.0051	91.0	91.1	91.3	1.958	.5
21	33	-.0606	0.0000	-.0283	.0056	.0035	.0020	91.2	91.4	91.6	.889	1.0
22	34	-.0950	0.0000	-.0443	.0022	.0010	.0000	91.5	91.6	-91.7	.569	1.5

IMPEDANCE DATA

GAP NO.	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	2.109	-2340.367	.000000	.000427	0.000	0.000	1.182	-2340.368	1000.000	0.0
2	2.109	-2340.367	.000000	.000427	0.000	0.000	1.182	-2340.368	1000.000	-180.0
3					INFINITE	INFINITE	-99.796	4.515	3.693	62.0
6					INFINITE	INFINITE	-99.796	4.515	3.693	-118.0
9					INFINITE	INFINITE	.000	.000	.000	-61.4
10					INFINITE	INFINITE	-.000	-.000	.000	-61.4
4					INFINITE	INFINITE	-600.000	.000	4.576	170.1
7					INFINITE	INFINITE	-600.000	.000	4.576	-9.9

INPUT POWER = .770 WATTS
RADIATED POWER = -.253 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 1.024 WATTS
RADIATION EFFICIENCY = -32.91 PER CENT

EXCITATION MODE

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

WIRE NO	INT NO	COORDINATES X WAVELENGTHS	COORDINATES Y WAVELENGTHS	COORDINATES Z WAVELENGTHS	CURRENT DISTRIBUTION AMPLITUDE AMP	AMP	AMP	CURRENT DISTRIBUTION PHASE DEG	DEG	DEG	NORMAL ELECTRIC FIELD * RADIUS VOLTS	DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1			164.232	-1.6
1	1	0.0000	0.0000	.0047	.3995	.3231	.2549	88.2	88.1	88.1	147.370	-1.7
1	2	0.0000	0.0000	.0141	.2589	.1951	.1318	88.1	88.1	88.0	129.501	-1.9
1	3	0.0000	0.0000	.0234	.1340	.0690	.0000	88.0	88.0	-92.6	136.587	-2.0
		0.0000	0.0000	.0000	GAP 2			GAP 2			164.232	-1.6
2	4	0.0000	0.0000	-.0047	.3995	.3231	.2549	88.2	88.1	88.1	147.370	-1.7
2	5	0.0000	0.0000	-.0141	.2589	.1951	.1318	88.1	88.1	88.0	129.501	-1.9
2	6	0.0000	0.0000	-.0234	.1340	.0690	.0000	88.0	88.0	-92.6	136.587	-2.0
		0.0000	0.0000	0.0000	GAP 3			GAP 3			49.577	-179.8
3	7	0.0000	.0041	.0023	.1991	.1781	.1638	-91.9	-92.2	-92.6	36.011	-179.0
3	8	0.0000	.0122	.0070	.1663	.1562	.1480	-92.6	-92.9	-93.3	18.753	-176.4
3	9	0.0000	.0203	.0117	.1485	.1416	.1355	-93.3	-93.8	-94.2	13.414	-174.0
4	10	0.0000	.0326	.0189	.1361	.1257	.1167	-94.2	-95.3	-96.5	9.971	-170.9
5	11	0.0000	.0579	.0334	.1179	.1024	.0879	-96.4	-99.3	-103.2	7.899	-167.7
6	12	0.0000	.0897	.0518	.0886	.0764	.0646	-103.0	-107.6	-114.3	7.903	-166.2
		0.0000	.1045	.0604			GAP 4			GAP 4	8.114	-165.4
		0.0000	.1045	.0604	GAP 5			GAP 5			6.562	151.1
7	13	0.0000	.1194	.0689	.0646	.0526	.0401	-114.3	-113.6	-113.0	6.830	153.5
8	14	0.0000	.1565	.0903	.0405	.0209	.0000	-113.5	-113.3	-119.6	7.554	156.5
		0.0000	0.0000	0.0000	GAP 6			GAP 6			49.577	-179.8
9	15	0.0000	.0041	-.0023	.1991	.1781	.1638	-91.9	-92.2	-92.6	36.011	-179.0
9	16	0.0000	.0122	-.0070	.1663	.1562	.1480	-92.6	-92.9	-93.3	18.753	-176.4
9	17	0.0000	.0203	-.0117	.1485	.1416	.1355	-93.3	-93.8	-94.2	13.414	-174.0
10	18	0.0000	.0326	-.0189	.1361	.1257	.1167	-94.2	-95.3	-96.5	9.971	-170.9
11	19	0.0000	.0579	-.0334	.1179	.1024	.0879	-96.4	-99.3	-103.2	7.899	-167.7
12	20	0.0000	.0897	-.0518	.0886	.0764	.0646	-103.0	-107.6	-114.3	7.903	-166.2
		0.0000	.1045	-.0604			GAP 7			GAP 7	8.114	-165.4
		0.0000	.1045	-.0604	GAP 8			GAP 8			6.562	151.1
13	21	0.0000	.1194	-.0689	.0646	.0526	.0401	-114.3	-113.6	-113.0	6.830	153.5
14	22	0.0000	.1565	-.0903	.0405	.0209	.0000	-113.5	-113.3	-119.6	7.554	156.5
		0.0000	0.0000	0.0000	GAP 9			GAP 9			37.653	175.6
15	23	.0042	0.0000	.0020	.0015	.0142	.0234	-61.4	82.3	83.5	25.167	175.5
15	24	.0127	0.0000	.0059	.0212	.0266	.0301	83.3	83.7	83.8	9.082	175.1
15	25	.0212	0.0000	.0099	.0297	.0320	.0334	83.8	83.8	83.8	3.777	174.4
16	26	.0342	0.0000	.0160	.0329	.0337	.0329	83.8	83.7	83.7	.038	78.5
17	27	.0606	0.0000	.0283	.0319	.0265	.0190	83.6	83.4	83.2	3.160	-5.8
18	28	.0950	0.0000	.0443	.0187	.0099	.0000	83.2	83.0	80.9	4.837	-6.8
		0.0000	0.0000	0.0000	GAP 10			GAP 10			37.653	175.6

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
19	29	-.0042	0.0000	-.0020	.0015	.0142	.0234	-61.4	82.3	83.5	25.167	175.5
19	30	-.0127	0.0000	-.0059	.0212	.0266	.0301	83.3	83.7	83.8	9.082	175.1
19	31	-.0212	0.0000	-.0099	.0297	.0320	.0334	83.8	83.8	83.8	3.777	174.4
20	32	-.0342	0.0000	-.0160	.0329	.0337	.0329	83.8	83.7	83.7	.038	78.5
21	33	-.0606	0.0000	-.0283	.0319	.0265	.0190	83.6	83.4	83.2	3.160	-5.8
22	34	-.0950	0.0000	-.0443	.0187	.0099	.0000	83.2	83.0	80.9	4.837	-6.8

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	81.124	-2501.685	.000013	.000399	0.000	0.000	80.109	-2501.750	1000.000	0.0
2	81.124	-2501.685	.000013	.000399	0.000	0.000	80.109	-2501.750	1000.000	0.0
3					INFINITE	INFINITE	-99.796	4.515	19.890	85.5
6					INFINITE	INFINITE	-99.796	4.515	19.890	85.5
9					INFINITE	INFINITE	-.000	47157.020	71.410	28.7
10					INFINITE	INFINITE	-.000	47157.020	71.410	28.7
4					INFINITE	INFINITE	-600.000	.000	38.751	-114.3
7					INFINITE	INFINITE	-600.000	.000	38.751	-114.3

INPUT POWER = 25.898 WATTS
RADIATED POWER = -.263 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 26.161 WATTS
RADIATION EFFICIENCY = -1.02 PER CENT

FREQUENCY = .5400 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 309

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 3.4 PER CENT FOR GAPS 9 AND 6

EXCITATION MODE 1.

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	3620000.0000	-0.0000	-0.0000	-0.0000
10	IMP	2- 0	3620000.0000	-0.0000	-0.0000	-0.0000
11	IMP	1- 2	*300000.0000	-0.0000	-0.0000	-0.0000

WIRE NO	INT NO	COORDINATES X WAVELENGTHS	COORDINATES Y WAVELENGTHS	COORDINATES Z WAVELENGTHS	CURRENT DISTRIBUTION AMPLITUDE			CURRENT DISTRIBUTION PHASE			NORMAL ELECTRIC FIELD * RADIUS	
					AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			185.635	-.0
1	1	0.0000	0.0000	.0056	.5151	.4124	.3231	90.0	90.0	90.0	163.095	-.0
1	2	0.0000	0.0000	.0169	.3292	.2471	.1664	90.0	90.0	90.0	138.249	-.0
1	3	0.0000	0.0000	.0281	.1694	.0870	.0000	90.0	90.0	-90.0	143.874	-.0
		0.0000	0.0000	0.0000	GAP 2			GAP 2			185.635	180.0
2	4	0.0000	0.0000	-.0056	.5151	.4124	.3231	-90.0	-90.0	-90.0	163.095	180.0
2	5	0.0000	0.0000	-.0169	.3292	.2471	.1664	-90.0	-90.0	-90.0	138.249	180.0

		X	Y	Z	AMPLITUDE			PHASE				
WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
2	6	0.0000	0.0000	-.0281	.1694	.0870	.0000	-90.0	-90.0	90.0	143.874	180.0
		0.0000	0.0000	0.0000	GAP 3			GAP 3			19.884	178.1
3	7	0.0000	.0049	.0028	.0365	.0276	.0222	-116.6	-125.4	-134.9	14.353	177.7
3	8	0.0000	.0146	.0084	.0230	.0196	.0173	-133.0	-141.6	-150.4	7.068	175.8
3	9	0.0000	.0243	.0141	.0175	.0159	.0149	-149.7	-158.0	-165.8	4.406	172.9
4	10	0.0000	.0392	.0227	.0150	.0138	.0131	-164.6	-177.3	172.5	2.435	165.8
5	11	0.0000	.0695	.0401	.0131	.0119	.0107	175.8	162.9	152.7	1.077	138.6
6	12	0.0000	.1076	.0621	.0106	.0094	.0081	154.3	146.0	136.6	.884	105.0
		0.0000	.1254	.0724			GAP 4			GAP 4	.915	94.8
		0.0000	.1254	.0724	GAP 5			GAP 5			.554	51.9
7	13	0.0000	.1432	.0827	.0081	.0068	.0054	136.6	135.8	135.0	.647	49.4
8	14	0.0000	.1878	.1084	.0054	.0028	.0000	134.9	133.8	-64.1	.835	44.9
		0.0000	0.0000	0.0000	GAP 6			GAP 6			19.884	-1.9
9	15	0.0000	.0049	-.0028	.0365	.0276	.0222	63.4	54.6	45.1	14.353	-2.3
9	16	0.0000	.0146	-.0084	.0230	.0196	.0173	47.0	38.4	29.6	7.068	-4.2
9	17	0.0000	.0243	-.0141	.0175	.0159	.0149	30.3	22.0	14.2	4.406	-7.1
10	18	0.0000	.0392	-.0227	.0150	.0138	.0131	15.4	2.7	-7.5	2.435	-14.2
11	19	0.0000	.0695	-.0401	.0131	.0119	.0107	-4.2	-17.1	-27.3	1.077	-41.4
12	20	0.0000	.1076	-.0621	.0106	.0094	.0081	-25.7	-34.0	-43.4	.884	-75.0
		0.0000	.1254	-.0724			GAP 7			GAP 7	.915	-85.2
		0.0000	.1254	-.0724	GAP 8			GAP 8			.554	-128.1
13	21	0.0000	.1432	-.0827	.0081	.0068	.0054	-43.4	-44.2	-45.0	.647	-130.6
14	22	0.0000	.1878	-.1084	.0054	.0028	.0000	-45.1	-46.2	115.9	.835	-135.1
		0.0000	0.0000	0.0000	GAP 9			GAP 9			14.327	-179.8
15	23	.0051	0.0000	.0024	.0321	.0248	.0198	-88.9	-88.6	-88.3	10.502	-179.8
15	24	.0153	0.0000	.0071	.0205	.0170	.0142	-88.4	-88.1	-87.8	5.381	-179.7
15	25	.0255	0.0000	.0119	.0144	.0122	.0103	-87.8	-87.5	-87.1	3.413	-179.6
16	26	.0410	0.0000	.0191	.0106	.0079	.0059	-87.2	-86.5	-85.6	1.946	-179.1
17	27	.0727	0.0000	.0339	.0065	.0040	.0022	-86.0	-84.8	-83.4	.869	-177.4
18	28	.1140	0.0000	.0532	.0025	.0012	.0000	-84.0	-83.1	-97.4	.538	-174.0
		0.0000	0.0000	0.0000	GAP 10			GAP 10			14.327	.2
19	29	-.0051	0.0000	-.0024	.0321	.0248	.0198	91.1	91.4	91.7	10.502	.2
19	30	-.0153	0.0000	-.0071	.0205	.0170	.0142	91.6	91.9	92.2	5.381	.3
19	31	-.0255	0.0000	-.0119	.0144	.0122	.0103	92.2	92.5	92.9	3.413	.4
20	32	-.0410	0.0000	-.0191	.0106	.0079	.0059	92.8	93.5	94.4	1.946	.9
21	33	-.0727	0.0000	-.0339	.0065	.0040	.0022	94.0	95.2	96.6	.869	2.6
22	34	-.1140	0.0000	-.0532	.0025	.0012	.0000	96.0	96.9	82.6	.538	6.0

	OHMS	OHMS	MHOS	MHOS	OHMS	OHMS	OHMS	OHMS	VOLT	DEGREES
6					INFINITE	INFINITE	-99.706	5.413	3.643	-119.8
9					INFINITE	INFINITE	.000	.000	.000	-47.8
10					INFINITE	INFINITE	-.000	-.000	.000	-47.8
4					INFINITE	INFINITE	-600.000	.000	4.880	136.6
7					INFINITE	INFINITE	-600.000	.000	4.880	-43.4

INPUT POWER = .913 WATTS
RADIATED POWER = -.122 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 1.035 WATTS
RADIATION EFFICIENCY = -13.33 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

		COORDINATES			CURRENT DISTRIBUTION						NORMAL ELECTRIC FIELD * RADIUS	
		X	Y	Z	AMPLITUDE			PHASE				
WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			165.105	-2.0
1	1	0.0000	0.0000	.0056	.4854	.3930	.3104	87.6	87.6	87.5	148.579	-2.1
1	2	0.0000	0.0000	.0169	.3152	.2377	.1607	87.5	87.5	87.5	131.235	-2.4
1	3	0.0000	0.0000	.0281	.1634	.0841	.0000	87.5	87.4	-93.4	138.775	-2.5
		0.0000	0.0000	0.0000	GAP 2			GAP 2			165.105	-2.0
2	4	0.0000	0.0000	-.0056	.4854	.3930	.3104	87.6	87.6	87.5	148.579	-2.1
2	5	0.0000	0.0000	-.0169	.3152	.2377	.1607	87.5	87.5	87.5	131.235	-2.4
2	6	0.0000	0.0000	-.0281	.1634	.0841	.0000	87.5	87.4	-93.4	138.775	-2.5

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 3			GAP 3			48.642	-179.4
3	7	0.0000	.0049	.0428	.2421	.2175	.2009	-92.5	-92.9	-93.4	35.132	-178.3
3	8	0.0000	.0146	.0644	.2038	.1923	.1829	-93.4	-93.9	-94.4	18.025	-174.3
3	9	0.0000	.0243	.0141	.1835	.1757	.1688	-94.4	-95.0	-95.6	12.881	-170.8
4	10	0.0000	.0392	.0227	.1695	.1577	.1474	-95.6	-97.0	-98.6	9.749	-166.7
5	11	0.0000	.0695	.0401	.1489	.1309	.1135	-98.5	-102.2	-107.0	8.236	-163.9
6	12	0.0000	.1076	.0621	.1143	.0992	.0845	-106.7	-112.4	-120.5	8.857	-164.7
		0.0000	.1254	.0724		GAP 4				GAP 4	9.317	-164.9
		0.0000	.1254	.0724	GAP 5			GAP 5			6.776	143.6
7	13	0.0000	.1432	.0827	.0845	.0694	.0533	-120.5	-119.6	-118.9	7.257	146.8
8	14	0.0000	.1878	.1084	.0539	.0280	.0000	-119.5	-119.3	64.5	8.389	150.5
		0.0000	0.0000	0.0000	GAP 6			GAP 6			48.642	-179.4
9	15	0.0000	.0049	-.0028	.2421	.2175	.2009	-92.5	-92.9	-93.4	35.132	-178.3
9	16	0.0000	.0146	-.0684	.2038	.1923	.1829	-93.4	-93.9	-94.4	18.025	-174.3
9	17	0.0000	.0243	-.0141	.1835	.1757	.1688	-94.4	-95.0	-95.6	12.881	-170.8
10	18	0.0000	.0392	-.0227	.1695	.1577	.1474	-95.6	-97.0	-98.6	9.749	-166.7
11	19	0.0000	.0695	-.0401	.1489	.1309	.1135	-98.5	-102.2	-107.0	8.236	-163.9
12	20	0.0000	.1076	-.0621	.1143	.0992	.0845	-106.7	-112.4	-120.5	8.857	-164.7
		0.0000	.1254	-.0724		GAP 7				GAP 7	9.317	-164.9
		0.0000	.1254	-.0724	GAP 8			GAP 8			6.776	143.6
13	21	0.0000	.1432	-.0827	.0845	.0694	.0533	-120.5	-119.6	-118.9	7.257	146.8
14	22	0.0000	.1878	-.1084	.0539	.0280	.0000	-119.5	-119.3	64.5	8.389	150.5
		0.0000	0.0000	0.0000	GAP 9			GAP 9			39.571	174.2
15	23	.0051	0.0000	.0024	.0017	.0184	.0301	-48.0	80.1	81.6	26.556	174.0
15	24	.0153	0.0000	.0071	.0274	.0342	.0389	81.3	81.7	81.9	9.761	173.3
15	25	.0255	0.0000	.0119	.0383	.0413	.0432	81.8	81.9	81.9	4.183	172.3
16	26	.0410	0.0000	.0191	.0426	.0438	.0429	81.8	81.7	81.6	.151	146.4
17	27	.0727	0.0000	.0339	.0417	.0349	.0251	81.5	81.2	81.0	3.381	-7.6
18	28	.1140	0.0000	.0532	.0248	.0132	.0000	80.9	80.7	-103.2	5.351	-9.1
		0.0000	0.0000	0.0000	GAP 10			GAP 10			39.571	174.2
19	29	-.0051	0.0000	-.0024	.0017	.0184	.0301	-48.0	80.1	81.6	26.556	174.0
19	30	-.0153	0.0000	-.0071	.0274	.0342	.0389	81.3	81.7	81.9	9.761	173.3
19	31	-.0255	0.0000	-.0119	.0383	.0413	.0432	81.8	81.9	81.9	4.183	172.3
20	32	-.0410	0.0000	-.0191	.0426	.0438	.0429	81.8	81.7	81.6	.151	146.4
21	33	-.0727	0.0000	-.0339	.0417	.0349	.0251	81.5	81.2	81.0	3.381	-7.6
22	34	-.1140	0.0000	-.0532	.0248	.0132	.0000	80.9	80.7	-103.2	5.351	-9.1

	OHMS	OHMS	MHOS	MHOS	OHMS	OHMS	OHMS	OHMS	VOLT	DEGREES
9					INFINITE	INFINITE	-.000	39297.517	67.867	42.2
10					INFINITE	INFINITE	-.000	39297.517	67.867	42.2
4					INFINITE	INFINITE	-600.000	.000	50.713	-120.5
					INFINITE	INFINITE	-600.000	-.000	50.713	-120.5

INPUT POWER = 40.690 WATTS
RADIATED POWER = -.380 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 41.070 WATTS
RADIATION EFFICIENCY = -.93 PER CENT

FREQUENCY = .7000 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 310

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 34.8 PER CENT FOR GAPS 9 AND 3

A-122

EXCITATION MODE

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	1310000.0000	-0.0000	-0.0000	-0.0000
10	IMP	2- 0	1310000.0000	-0.0000	-0.0000	-0.0000
11	IMP	1- 2	*910000.0000	-0.0000	-0.0000	-0.0000

WIRE NO.	INT NO.	COORDINATES X WAVELENGTHS	Y WAVELENGTHS	Z WAVELENGTHS	CURRENT DISTRIBUTION AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	NORMAL ELECTRIC FIELD * RADIUS VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			185.689	-.0
1	1	0.0000	0.0000	.0073	.6746	.5412	.4247	89.9	89.9	89.9	163.778	-.0
1	2	0.0000	0.0000	.0219	.4327	.3252	.2192	89.9	89.9	89.9	139.884	-.1
1	3	0.0000	0.0000	.0364	.2232	.1147	.0000	89.9	89.9	89.8	146.224	-.1
		0.0000	0.0000	0.0000	GAP 2			GAP 2			185.689	180.0
2	4	0.0000	0.0000	-.0073	.6746	.5412	.4247	-90.1	-90.1	-90.1	163.778	180.0
2	5	0.0000	0.0000	-.0219	.4327	.3252	.2192	-90.1	-90.1	-90.1	139.884	179.9
2	6	0.0000	0.0000	-.0364	.2232	.1147	.0000	-90.1	-90.1	-90.2	146.224	179.9
		0.0000	0.0000	0.0000	GAP 3			GAP 3			20.066	177.7
3	7	0.0000	.0063	.0037	.0399	.0270	.0184	-102.2	-106.9	-113.5	14.479	177.3
3	8	0.0000	.0189	.0110	.0198	.0141	.0100	-111.9	-119.5	-130.7	7.094	175.4
3	9	0.0000	.0315	.0183	.0103	.0075	.0059	-129.6	-145.3	-167.2	4.366	172.9
4	10	0.0000	.0508	.0294	.0060	.0055	.0067	-163.1	153.7	127.8	2.300	166.8
5	11	0.0000	.0901	.0520	.0059	.0073	.0078	133.9	109.8	96.5	.748	137.3
6	12	0.0000	.1395	.0805	.0074	.0072	.0065	97.2	86.7	74.8	.514	68.0
		0.0000	.1625	.0939			GAP 4			GAP 4	.618	47.4
		0.0000	.1625	.0939	GAP 5			GAP 5			.169	-22.0
7	13	0.0000	.1857	.1072	.0065	.0059	.0048	74.8	75.1	75.1	.306	-16.1
8	14	0.0000	.2434	.1405	.0048	.0026	.0000	74.3	73.4	67.5	.576	-15.7
		0.0000	0.0000	0.0000	GAP 6			GAP 6			20.066	-2.3
9	15	0.0000	.0063	-.0037	.0399	.0270	.0184	77.8	73.1	66.5	14.479	-2.7
9	16	0.0000	.0189	-.0110	.0198	.0141	.0100	68.1	60.5	49.3	7.094	-4.6
9	17	0.0000	.0315	-.0183	.0103	.0075	.0059	50.4	34.7	12.8	4.366	-7.1
10	18	0.0000	.0508	-.0294	.0060	.0055	.0067	16.9	-26.3	-52.2	2.300	-13.2
11	19	0.0000	.0901	-.0520	.0059	.0073	.0078	-46.1	-70.2	-83.5	.748	-42.7
12	20	0.0000	.1395	-.0805	.0074	.0072	.0065	-82.8	-93.3	-105.2	.514	-112.0
		0.0000	.1625	-.0939			GAP 7			GAP 7	.618	-132.6
		0.0000	.1625	-.0939	GAP 8			GAP 8			.169	158.0
13	21	0.0000	.1857	-.1072	.0065	.0059	.0048	-105.2	-104.9	-104.9	.306	163.9
14	22	0.0000	.2434	-.1405	.0048	.0026	.0000	-105.7	-106.6	-112.5	.576	164.3
		0.0000	0.0000	0.0000	GAP 9			GAP 9			14.340	-179.8
15	23	.0066	0.0000	.0031	.0413	.0319	.0254	-84.1	-82.4	-80.6	10.513	-179.7
15	24	.0198	0.0000	.0092	.0264	.0218	.0183	-80.9	-79.1	-77.2	5.378	-179.3
15	25	.0330	0.0000	.0154	.0185	.0157	.0135	-77.3	-75.3	-73.1	3.402	-178.3
16	26	.0532	0.0000	.0248	.0138	.0104	.0080	-73.5	-69.2	-64.3	1.930	-175.7

WIRE NO	INT. NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
17	27	.0942	0.0000	.0440	.0087	.0056	.0033	-66.4	-59.8	-52.8	.872	-164.6
18	28	.1478	0.0000	.0690	.0036	.0018	.0000	-56.0	-52.3	28.2	.609	-146.0
		0.0000	0.0000	0.0000	GAP 10			GAP 10			14.340	.2
19	29	-.0066	0.0000	-.0031	.0413	.0319	.0254	95.9	97.6	99.4	10.513	.3
19	30	-.0198	0.0000	-.0092	.0264	.0218	.0183	99.1	100.9	102.8	5.378	.7
19	31	-.0330	0.0000	-.0154	.0185	.0157	.0135	102.7	104.7	106.9	3.402	1.7
20	32	-.0532	0.0000	-.0248	.0138	.0104	.0080	106.5	110.8	115.7	1.930	4.3
21	33	-.0942	0.0000	-.0440	.0087	.0056	.0033	113.6	120.2	127.2	.872	15.4
22	34	-.1478	0.0000	-.0690	.0036	.0018	.0000	124.0	127.7	-151.8	.609	34.0

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	DEGREES
1	1.517	-1482.258	.000001	.000675	0.000	0.000	1.350	-1482.258	1000.000	0.0
2	1.517	-1482.258	.000001	.000675	0.000	0.000	1.350	-1482.258	1000.000	-180.0
3					INFINITE	INFINITE	-99.507	7.002	3.977	73.8
6					INFINITE	INFINITE	-99.507	7.002	3.977	-106.2
9					INFINITE	INFINITE	.000	.000	.000	-15.5
10					INFINITE	INFINITE	-.000	-.000	.000	-15.5
4					INFINITE	INFINITE	-600.000	.000	3.920	74.8
7					INFINITE	INFINITE	-600.000	.000	3.920	-105.2

INPUT POWER = 1.381 WATTS
RADIATED POWER = .494 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = .887 WATTS
RADIATION EFFICIENCY = 35.76 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

WIRE NO.	INT NO	COORDINATES X WAVE-LENGTHS	COORDINATES Y WAVE-LENGTHS	COORDINATES Z WAVE-LENGTHS	CURRENT DISTRIBUTION AMPLITUDE			CURRENT DISTRIBUTION PHASE			NORMAL ELECTRIC FIELD * RADIUS VOLTS	NORMAL ELECTRIC FIELD * RADIUS DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			167.140	-3.0
1	1	0.0000	0.0000	.0073	.6471	.5255	.4161	86.3	86.2	86.1	151.382	-3.3
1	2	0.0000	0.0000	.0219	.4223	.3190	.2159	86.1	86.0	86.0	135.249	-3.8
1	3	0.0000	0.0000	.0364	.2195	.1131	.0000	86.0	85.9	84.6	143.844	-4.0
		0.0000	0.0000	0.0000	GAP 2			GAP 2			167.140	-3.0
2	4	0.0000	0.0000	-.0073	.6471	.5255	.4161	86.3	86.2	86.1	151.382	-3.3
2	5	0.0000	0.0000	-.0219	.4223	.3190	.2159	86.1	86.0	86.0	135.249	-3.8
2	6	0.0000	0.0000	-.0364	.2195	.1131	.0000	86.0	85.9	84.6	143.844	-4.0
		0.0000	0.0000	0.0000	GAP 3			GAP 3			46.483	-177.8
3	7	0.0000	.0063	.0037	.3233	.2932	.2733	-93.9	-94.7	-95.5	33.164	-175.5
3	8	0.0000	.0189	.0110	.2772	.2639	.2533	-95.4	-96.3	-97.2	16.598	-167.2
3	9	0.0000	.0315	.0183	.2541	.2454	.2378	-97.2	-98.2	-99.2	12.066	-160.4
4	10	0.0000	.0508	.0294	.2387	.2259	.2143	-99.2	-101.4	-103.9	9.773	-154.5
5	11	0.0000	.0901	.0520	.2163	.1952	.1727	-103.8	-109.3	-116.0	9.494	-156.2
6	12	0.0000	.1395	.0805	.1739	.1532	.1329	-115.7	-123.4	-134.1	11.475	-164.4
		0.0000	.1625	.0939			GAP 4			GAP 4	12.504	-167.3
		0.0000	.1625	.0939	GAP 5			GAP 5			7.150	127.0
7	13	0.0000	.1857	.1072	.1329	.1114	.0871	-134.1	-132.9	-132.1	8.253	132.1
8	14	0.0000	.2434	.1405	.0879	.0465	.0000	-132.8	-132.6	-131.2	10.604	137.2
		0.0000	0.0000	0.0000	GAP 6			GAP 6			46.483	-177.8
9	15	0.0000	.0063	-.0037	.3233	.2932	.2733	-93.9	-94.7	-95.5	33.164	-175.5
9	16	0.0000	.0189	-.0110	.2772	.2639	.2533	-95.4	-96.3	-97.2	16.598	-167.2
9	17	0.0000	.0315	-.0183	.2541	.2454	.2378	-97.2	-98.2	-99.2	12.066	-160.4
10	18	0.0000	.0508	-.0294	.2387	.2259	.2143	-99.2	-101.4	-103.9	9.773	-154.5
11	19	0.0000	.0901	-.0520	.2163	.1952	.1727	-103.8	-109.3	-116.0	9.494	-156.2
12	20	0.0000	.1395	-.0805	.1739	.1532	.1329	-115.7	-123.4	-134.1	11.475	-164.4
		0.0000	.1625	-.0939			GAP 7			GAP 7	12.504	-167.3
		0.0000	.1625	-.0939	GAP 8			GAP 8			7.150	127.0
13	21	0.0000	.1857	-.1072	.1329	.1114	.0871	-134.1	-132.9	-132.1	8.253	132.1
14	22	0.0000	.2434	-.1405	.0879	.0465	.0000	-132.8	-132.6	-131.2	10.604	137.2
		0.0000	0.0000	0.0000	GAP 9			GAP 9			44.349	170.1
15	23	.0066	0.0000	.0031	.0026	.0283	.0457	15.3	74.7	76.6	30.048	169.9
15	24	.0198	0.0000	.0092	.0418	.0521	.0594	76.2	76.7	76.9	11.530	168.5
15	25	.0330	0.0000	.0154	.0585	.0634	.0666	76.8	76.8	76.8	5.273	166.6
16	26	.0532	0.0000	.0248	.0657	.0682	.0674	76.7	76.5	76.3	.571	150.0
17	27	.0942	0.0000	.0440	.0656	.0560	.0408	76.2	75.6	75.1	3.938	-12.1
18	28	.1478	0.0000	.0690	.0403	.0217	.0000	75.1	74.7	70.6	6.725	-14.9
		0.0000	0.0000	0.0000	GAP 10			GAP 10			44.349	170.1

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
19	29	-.0066	0.0000	-.0031	.0026	.0283	.0457	-15.3	74.7	76.6	30.048	169.9
19	30	-.0198	0.0000	-.0092	.0418	.0521	.0594	76.2	76.7	76.9	11.530	168.5
19	31	-.0330	0.0000	-.0154	.0585	.0634	.0666	76.8	76.8	76.8	5.273	166.6
20	32	-.0532	0.0000	-.0248	.0657	.0682	.0674	76.7	76.5	76.3	.571	150.0
21	33	-.0942	0.0000	-.0440	.0656	.0560	.0408	76.2	75.6	75.1	3.938	-12.1
22	34	-.1478	0.0000	-.0690	.0403	.0217	.0000	75.1	74.7	70.6	6.725	-14.9

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	DEGREES
1	101.631	-1541.827	.000043	.000646	0.000	0.000	99.823	-1542.064	1000.000	0.0
2	101.631	-1541.827	.000043	.000646	0.000	0.000	99.823	-1542.064	1000.000	0.0
3					INFINITE	INFINITE	-99.507	7.002	32.250	82.0
6					INFINITE	INFINITE	-99.507	7.002	32.250	82.0
9					INFINITE	INFINITE	-.000	30315.227	79.429	74.5
10					INFINITE	INFINITE	-.000	30315.227	79.429	74.5
4					INFINITE	INFINITE	-600.000	.000	79.714	-134.1
7					INFINITE	INFINITE	-600.000	.000	79.714	-134.1

INPUT POWER = 85.133 WATTS
RADIATED POWER = -.358 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 85.492 WATTS
RADIATION EFFICIENCY = -.42 PER CENT

FREQUENCY = .9000 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 311

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 9.1 PER CENT FOR GAPS 4 AND 9

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	435000.0000	-0.0000	-0.0000	-0.0000
10	IMP	2- 0	435000.0000	-0.0000	-0.0000	-0.0000
11	IMP	1- 2	-895000.0000	-0.0000	-0.0000	-0.0000

WIRE NO	INT NO	COORDINATES X WAVELENGTHS	COORDINATES Y WAVELENGTHS	COORDINATES WAVELENGTHS	CURRENT DISTRIBUTION AMPLITUDE AMP	AMP	AMP	CURRENT DISTRIBUTION PHASE DEG	DEG	DEG	NORMAL ELECTRIC FIELD * RADIUS VOLTS	DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1			185.746	-.1
1	1	0.0000	0.0000	.0094	.8819	.7098	.5585	89.9	89.9	89.9	164.875	-.1
1	2	0.0000	0.0000	.0281	.5688	.4284	.2891	89.9	89.9	89.9	142.557	-.1
1	3	0.0000	0.0000	.0469	.2944	.1514	.0000	89.9	89.9	-90.3	150.064	-.1
		0.0000	0.0000	.0000	GAP 2			GAP 2			185.746	179.9
2	4	0.0000	0.0000	-.0094	.8819	.7098	.5585	-90.1	-90.1	-90.1	164.875	179.9
2	5	0.0000	0.0000	-.0281	.5688	.4284	.2891	-90.1	-90.1	-90.1	142.557	179.9

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
2	6	0.0000	0.0000	-.0469	.2944	.1514	.0000	-90.1	-90.1	89.7	150.064	179.9
		0.0000	0.0000	0.0000	GAP 3			GAP 3			20.169	176.8
3	7	0.0000	.0081	.0047	.0556	.0385	.0270	-94.6	-95.2	-95.5	14.548	176.2
3	8	0.0000	.0243	.0141	.0290	.0211	.0150	-95.3	-95.2	-94.6	7.097	174.0
3	9	0.0000	.0405	.0235	.0155	.0108	.0070	-94.5	-93.0	-89.4	4.335	171.2
4	10	0.0000	.0653	.0378	.0076	.0027	.0026	-89.5	-62.1	24.3	2.232	165.2
5	11	0.0000	.1158	.0669	.0023	.0049	.0064	-6.8	32.0	31.9	.588	139.8
6	12	0.0000	.1793	.1036	.0061	.0064	.0062	28.2	21.0	8.7	.293	20.8
		0.0000	.2089	.1207			GAP 4			GAP 4	.483	-3.9
		0.0000	.2089	.1207	GAP 5			GAP 5			.178	-161.4
7	13	0.0000	.2387	.1378	.0062	.0059	.0050	8.7	13.4	16.2	.195	-109.0
8	14	0.0000	.3130	.1807	.0050	.0029	.0000	14.1	14.9	-160.0	.470	-75.9
		0.0000	0.0000	0.0000	GAP 6			GAP 6			20.169	-3.2
9	15	0.0000	.0081	-.0047	.0556	.0385	.0270	85.4	84.8	84.5	14.548	-3.8
9	16	0.0000	.0243	-.0141	.0290	.0211	.0150	84.7	84.8	85.4	7.097	-6.0
9	17	0.0000	.0405	-.0235	.0155	.0108	.0070	85.5	87.0	90.6	4.335	-8.8
10	18	0.0000	.0653	-.0378	.0076	.0027	.0026	90.5	117.9	-155.7	2.232	-14.8
11	19	0.0000	.1158	-.0669	.0023	.0049	.0064	173.2	-148.0	-148.1	.588	-40.2
12	20	0.0000	.1793	-.1036	.0061	.0064	.0062	-151.8	-159.0	-171.3	.293	-159.2
		0.0000	.2089	-.1207			GAP 7			GAP 7	.483	176.1
		0.0000	.2089	-.1207	GAP 8			GAP 8			.178	18.6
13	21	0.0000	.2387	-.1378	.0062	.0059	.0050	-171.3	-166.6	-163.8	.195	71.0
14	22	0.0000	.3130	-.1807	.0050	.0029	.0000	-165.9	-165.1	20.0	.470	104.1
		0.0000	0.0000	0.0000	GAP 9			GAP 9			14.376	-179.7
15	23	.0085	0.0000	.0040	.1008	.0885	.0798	-91.7	-91.9	-92.2	10.707	-179.8
15	24	.0255	0.0000	.0119	.0811	.0748	.0696	-92.1	-92.3	-92.5	5.879	180.0
15	25	.0424	0.0000	.0198	.0699	.0655	.0616	-92.5	-92.6	-92.7	4.214	179.6
16	26	.0684	0.0000	.0319	.0621	.0554	.0492	-92.7	-92.9	-93.1	3.207	178.8
17	27	.1212	0.0000	.0566	.0502	.0387	.0261	-93.0	-93.3	-93.4	2.980	177.4
18	28	.1901	0.0000	.0887	.0269	.0140	.0000	-93.4	-93.5	-93.7	3.511	176.6
		0.0000	0.0000	0.0000	GAP 10			GAP 10			14.376	.3
19	29	-.0085	0.0000	-.0040	.1008	.0885	.0798	88.3	88.1	87.8	10.707	.2
19	30	-.0255	0.0000	-.0119	.0811	.0748	.0696	87.9	87.7	87.5	5.879	-.0
19	31	-.0424	0.0000	-.0198	.0699	.0655	.0616	87.5	87.4	87.3	4.214	-.4
20	32	-.0684	0.0000	-.0319	.0621	.0554	.0492	87.3	87.1	86.9	3.207	-1.2
21	33	-.1212	0.0000	-.0566	.0502	.0387	.0261	87.0	86.7	86.6	2.980	-2.6
22	34	-.1901	0.0000	-.0887	.0269	.0140	.0000	86.6	86.5	86.3	3.511	-3.4

	OHMS	OHMS	MHOS	MHOS	OHMS	OHMS	OHMS	OHMS	VOLT	DEGREES
6					INFINITE	INFINITE	-99.188	8.974	5.533	-99.8
9					INFINITE	INFINITE	-.000	.000	.000	6.3
10					INFINITE	INFINITE	.000	-.000	.000	6.3
4					INFINITE	INFINITE	-600.000	.000	3.725	8.7
7					INFINITE	INFINITE	-600.000	-.000	3.725	-171.3

INPUT POWER = 2.712 WATTS
RADIATED POWER = 1.266 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 1.446 WATTS
RADIATION EFFICIENCY = 46.70 PER CENT

EXCITATION MODE 2.

GAP SOURCES

GAP	EMF VOLT.	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	0.00	0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	0.00	0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

WIRE NO.	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1			169.787	-5.1
1	1	0.0000	0.0000	.0094	.8650	.7055	.5605	83.4	83.1	82.9	155.244	-5.7
1	2	0.0000	0.0000	.0281	.5685	.4305	.2918	83.0	82.9	82.8	141.036	-6.7
1	3	0.0000	0.0000	.0469	.2967	.1531	.0000	82.8	82.7	-100.0	151.255	-7.2
		0.0000	0.0000	.0000	GAP 2			GAP 2			169.787	-5.1
2	4	0.0000	0.0000	-.0094	.8650	.7055	.5605	83.4	83.1	82.9	155.244	-5.7
2	5	0.0000	0.0000	-.0281	.5685	.4305	.2918	83.0	82.9	82.8	141.036	-6.7
2	6	0.0000	0.0000	-.0469	.2967	.1531	.0000	82.8	82.7	-100.0	151.255	-7.2

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE			PHASE			VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 3			GAP 3			43.901	-172.4
3	7	0.0000	.0081	.0047	.4332	.3981	.3761	-97.0	-98.5	-100.2	31.348	-166.9
3	8	0.0000	.0243	.0141	.3811	.3673	.3568	-100.1	-101.9	-103.6	16.872	-149.0
3	9	0.0000	.0405	.0235	.3579	.3497	.3429	-103.6	-105.5	-107.3	13.897	-138.9
4	10	0.0000	.0653	.0378	.3441	.3328	.3223	-107.3	-111.3	-115.4	12.840	-136.2
5	11	0.0000	.1158	.0669	.3251	.3038	.2769	-115.2	-124.0	-134.0	13.489	-150.4
6	12	0.0000	.1793	.1036	.2790	.2516	.2249	-133.5	-144.4	-158.6	17.053	-171.9
		0.0000	.2089	.1207			GAP 4			GAP 4	18.918	-179.2
		0.0000	.2089	.1207	GAP 5			GAP 5			7.045	96.0
7	13	0.0000	.2387	.1378	.2249	.1955	.1569	-158.6	-157.1	-156.2	9.593	105.9
8	14	0.0000	.3130	.1807	.1583	.0858	.0000	-157.0	-157.0	23.7	14.958	113.0
		0.0000	0.0000	0.0000	GAP 6			GAP 6			43.901	-172.4
9	15	0.0000	.0081	-.0047	.4332	.3981	.3761	-97.0	-98.5	-100.2	31.348	-166.9
9	16	0.0000	.0243	-.0141	.3811	.3673	.3568	-100.1	-101.9	-103.6	16.872	-149.0
9	17	0.0000	.0405	-.0235	.3579	.3497	.3429	-103.6	-105.5	-107.3	13.897	-138.9
10	18	0.0000	.0653	-.0378	.3441	.3328	.3223	-107.3	-111.3	-115.4	12.840	-136.2
11	19	0.0000	.1158	-.0669	.3251	.3038	.2769	-115.2	-124.0	-134.0	13.489	-150.4
12	20	0.0000	.1793	-.1036	.2790	.2516	.2249	-133.5	-144.4	-158.6	17.053	-171.9
		0.0000	.2089	-.1207			GAP 7			GAP 7	18.918	-179.2
		0.0000	.2089	-.1207	GAP 8			GAP 8			7.045	96.0
13	21	0.0000	.2387	-.1378	.2249	.1955	.1569	-158.6	-157.1	-156.2	9.593	105.9
14	22	0.0000	.3130	-.1807	.1583	.0858	.0000	-157.0	-157.0	23.7	14.958	113.0
		0.0000	0.0000	0.0000	GAP 9			GAP 9			52.585	160.9
15	23	.0085	0.0000	.0040	.0065	.0467	.0741	6.3	63.5	65.8	36.228	160.3
15	24	.0255	0.0000	.0119	.0684	.0854	.0977	65.2	65.7	65.9	14.928	157.4
15	25	.0424	0.0000	.0198	.0965	.1051	.1113	65.8	65.7	65.5	7.529	153.9
16	26	.0684	0.0000	.0319	.1100	.1160	.1162	65.4	64.9	64.4	1.611	137.7
17	27	.1212	0.0000	.0566	.1136	.0995	.0736	64.3	63.2	62.3	4.951	-22.1
18	28	.1901	0.0000	.0887	.0731	.0397	.0000	62.2	61.3	59.7	9.521	-27.8
		0.0000	0.0000	0.0000	GAP 10			GAP 10			52.585	160.9
19	29	-.0085	0.0000	-.0040	.0065	.0467	.0741	6.3	63.5	65.8	36.228	160.3
19	30	-.0255	0.0000	-.0119	.0684	.0854	.0977	65.2	65.7	65.9	14.928	157.4
19	31	-.0424	0.0000	-.0198	.0965	.1051	.1113	65.8	65.7	65.5	7.529	153.9
20	32	-.0684	0.0000	-.0319	.1100	.1160	.1162	65.4	64.9	64.4	1.611	137.7
21	33	-.1212	0.0000	-.0566	.1136	.0995	.0736	64.3	63.2	62.3	4.951	-22.1
22	34	-.1901	0.0000	-.0887	.0731	.0397	.0000	62.2	61.3	59.7	9.521	-27.8

IMPÉDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	135.653	-1147.713	.000102	.000859	0.000	0.000	132.664	-1148.421	1000.000	0.0
2	135.653	-1147.713	.000102	.000859	0.000	0.000	132.664	-1148.421	1000.000	0.0
3					INFINITE	INFINITE	-99.188	8.974	43.148	77.8
6					INFINITE	INFINITE	-99.188	8.974	43.148	77.8

	OHMS	OHMS	MHOS	MHOS	OHMS	OHMS	OHMS	OHMS	VOLT	DEGREES
9					INFINITE	INFINITE	-.000	23578.510	152.603	96.4
10					INFINITE	INFINITE	-.000	23578.510	152.603	96.4
4					INFINITE	INFINITE	-600.000	.000	134.938	-158.6
7					INFINITE	INFINITE	-600.000	.000	134.938	-158.6

INPUT POWER = 203.127 WATTS
RADIATED POWER = 2.672 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 200.455 WATTS
PADIATION EFFICIENCY = 1.32 PER CENT

FREQUENCY = .9950 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 312

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 18.6 PER CENT FOR GAPS 4 AND 9

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS		PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3-	0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6-	0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3-	0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6-	0	-0.0000	-0.0000	160.0000	-0.0000

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	267000.0000	-0.0000	-0.0000	-0.0000
10	IMP	2- 0	267000.0000	-0.0000	-0.0000	-0.0000
11	IMP	1- 2	-552000.0000	-0.0000	-0.0000	-0.0000

			COORDINATES			CURRENT DISTRIBUTION						NORMAL ELECTRIC FIELD * RADIUS	
			X	Y	Z	AMPLITUDE			PHASE				
	WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
			0.0000	0.0000	0.0000	GAP 1			GAP 1			185.763	-.1
	1	1	0.0000	0.0000	.0104	.9846	.7939	.6256	89.9	89.9	89.9	165.511	-.1
	1	2	0.0000	0.0000	.0311	.6371	.4804	.3245	89.9	89.9	89.9	144.142	-.1
	1	3	0.0000	0.0000	.0518	.3304	.1701	.0000	89.9	89.9	-90.5	152.362	-.1
			0.0000	0.0000	0.0000	GAP 2			GAP 2			185.763	179.9
A-132	2	4	0.0000	0.0000	-.0104	.9846	.7939	.6256	-90.1	-90.1	-90.1	165.511	179.9
	2	5	0.0000	0.0000	-.0311	.6371	.4804	.3245	-90.1	-90.1	-90.1	144.142	179.9
	2	6	0.0000	0.0000	-.0518	.3304	.1701	.0000	-90.1	-90.1	89.5	152.362	179.9
			0.0000	0.0000	0.0000	GAP 3			GAP 3			20.189	176.2
	3	7	0.0000	.0090	-.0052	.0648	.0460	.0333	-93.8	-93.7	-93.2	14.554	175.6
	3	8	0.0000	.0269	.0156	.0354	.0268	.0202	-93.1	-92.1	-90.3	7.073	173.1
	3	9	0.0000	.0448	.0259	.0206	.0155	.0116	-90.3	-87.4	-82.6	4.296	170.1
	4	10	0.0000	.0722	.0418	.0122	.0071	.0050	-83.1	-65.9	-34.3	2.180	163.9
	5	11	0.0000	.1280	.0739	.0060	.0062	.0071	-46.7	-13.9	-6.2	.517	141.4
	6	12	0.0000	.1982	.1145	.0072	.0074	.0071	-10.6	-15.3	-27.1	.261	-19.7
			0.0000	.2310	.1334			GAP 4			GAP 4	.500	-34.9
			0.0000	.2310	.1334	GAP 5			GAP 5			.277	163.2
	7	13	0.0000	.2639	.1524	.0071	.0067	.0058	-27.1	-19.9	-15.5	.238	-155.2
	8	14	0.0000	.3460	.1998	.0058	.0034	.0000	-18.2	-16.2	178.6	.496	-108.2
			0.0000	0.0000	0.0000	GAP 6			GAP 6			20.189	-3.8
	9	15	0.0000	.0090	-.0052	.0648	.0460	.0333	86.2	86.3	86.8	14.554	-4.4
	9	16	0.0000	.0269	-.0156	.0354	.0268	.0202	86.9	87.9	89.7	7.073	-6.9
	9	17	0.0000	.0448	-.0259	.0206	.0155	.0116	89.7	92.6	97.4	4.296	-9.9
	10	18	0.0000	.0722	-.0418	.0122	.0071	.0050	96.9	114.1	145.7	2.180	-16.1
	11	19	0.0000	.1280	-.0739	.0060	.0062	.0071	133.3	166.1	173.8	.517	-38.6
	12	20	0.0000	.1982	-.1145	.0072	.0074	.0071	169.4	164.7	152.9	.261	160.3
			0.0000	.2310	-.1334			GAP 7			GAP 7	.500	145.1
			0.0000	.2310	-.1334	GAP 8			GAP 8			.277	-16.8
	13	21	0.0000	.2639	-.1524	.0071	.0067	.0058	152.9	160.1	164.5	.238	24.8
	14	22	0.0000	.3460	-.1998	.0058	.0034	.0000	161.8	163.8	-1.4	.496	71.8
			-.0000	0.0000	-.0000	GAP 9			GAP 9			14.401	-179.7
	15	23	.0094	0.0000	.0044	.0744	.0614	.0524	-104.2	-107.3	-110.3	10.607	180.0
	15	24	.0282	0.0000	.0131	.0538	.0475	.0426	-109.8	-112.4	-114.8	5.525	178.5
	15	25	.0469	0.0000	.0219	.0429	.0389	.0356	-114.6	-116.9	-119.0	3.624	175.7
	16	26	.0756	0.0000	.0353	.0361	.0308	.0265	-118.7	-122.2	-125.2	2.297	168.7

WIRE NO	INT NO	X WAVELENGTHS	Y WAVELENGTHS	Z WAVELENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
17	27	.1339	0.0000	.0625	.0275	.0204	.0134	-123.9	-127.1	-129.8	1.592	151.7
18	28	.2101	0.0000	.0981	.0140	.0072	.0000	-128.3	-129.3	-130.7	1.657	141.7
		.0000	0.0000	.0000	GAP 10			GAP 10			14.401	.3
19	29	-.0094	0.0000	-.0044	.0744	.0614	.0524	75.8	72.7	69.7	10.607	-.0
19	30	-.0282	0.0000	-.0131	.0538	.0475	.0426	70.2	67.6	65.2	5.525	-1.5
19	31	-.0469	0.0000	-.0219	.0429	.0389	.0356	65.4	63.1	61.0	3.624	-4.3
20	32	-.0756	0.0000	-.0353	.0361	.0308	.0265	61.3	57.8	54.8	2.297	-11.3
21	33	-.1339	0.0000	-.0625	.0275	.0204	.0134	56.1	52.9	50.2	1.592	-28.3
22	34	-.2101	0.0000	-.0981	.0140	.0072	.0000	51.7	50.7	49.3	1.657	-38.3

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	1.999	-1015.667	.000002	.000985	0.000	0.000	1.873	-1015.668	1000.000	0.0
2	1.999	-1015.667	.000002	.000985	0.000	0.000	1.873	-1015.668	1000.000	-180.0
3					INFINITE	INFINITE	-99.009	9.904	6.452	80.5
6					INFINITE	INFINITE	-99.009	9.904	6.452	-99.5
9					INFINITE	INFINITE	-.000	.000	.000	6.3
10					INFINITE	INFINITE	.000	-.000	.000	6.3
4					INFINITE	INFINITE	-600.000	-.000	4.280	-27.1
7					INFINITE	INFINITE	-600.000	-.000	4.280	152.9

INPUT POWER = 3.875 WATTS
RADIATED POWER = 1.843 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 2.032 WATTS
RADIATION EFFICIENCY = 47.57 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
			COORDINATES				CURRENT DISTRIBUTION				NORMAL ELECTRIC FIELD * RADIUS	
				Y	Z	AMPLITUDE			PHASE			
		0.0000	0.0000	0.0000	GAP 1			GAP 1			170.185	-6.5
1	1	0.0000	0.0000	.0104	.9679	.7908	.6292	81.5	81.2	80.9	156.227	-7.3
1	2	0.0000	0.0000	.0311	.6381	.4837	.3281	81.0	80.8	80.7	142.938	-8.7
1	3	0.0000	0.0000	.0518	.3336	.1722	.0000	80.7	80.6	-102.9	153.846	-9.3
		0.0000	0.0000	0.0000	GAP 2			GAP 2			170.185	-6.5
2	4	0.0000	0.0000	-.0104	.9679	.7908	.6292	81.5	81.2	80.9	156.227	-7.3
2	5	0.0000	0.0000	-.0311	.6381	.4837	.3281	81.0	80.8	80.7	142.938	-8.7
2	6	0.0000	0.0000	-.0518	.3336	.1722	.0000	80.7	80.6	-102.9	153.846	-9.3
		0.0000	0.0000	0.0000	GAP 3			GAP 3			43.865	-168.4
3	7	0.0000	.0090	.0052	.4852	.4478	.4249	-99.0	-101.1	-103.4	32.065	-161.3
3	8	0.0000	.0269	.0156	.4304	.4165	.4062	-103.3	-105.6	-107.9	19.229	-141.0
3	9	0.0000	.0448	.0259	.4074	.3996	.3933	-107.9	-110.3	-112.8	16.951	-132.9
4	10	0.0000	.0722	.0418	.3946	.3847	.3753	-112.7	-117.8	-123.0	16.110	-133.5
5	11	0.0000	.1280	.0739	.3784	.3584	.3312	-122.8	-133.6	-145.7	16.577	-152.5
6	12	0.0000	.1982	.1145	.3338	.3048	.2773	-145.1	-157.8	-173.8	20.462	-179.3
		0.0000	.2310	.1334			GAP 4			GAP 4	22.623	171.3
		0.0000	.2310	.1334	GAP 5			GAP 5			6.343	75.0
7	13	0.0000	.2639	.1524	.2773	.2461	.2006	-173.8	-172.2	-171.2	9.836	89.6
8	14	0.0000	.3460	.1998	.2023	.1112	.0000	-172.2	-172.2	7.3	17.360	97.8
		0.0000	0.0000	0.0000	GAP 6			GAP 6			43.865	-168.4
9	15	0.0000	.0090	-.0052	.4852	.4478	.4249	-99.0	-101.1	-103.4	32.065	-161.3
9	16	0.0000	.0269	-.0156	.4304	.4165	.4062	-103.3	-105.6	-107.9	19.229	-141.0
9	17	0.0000	.0448	-.0259	.4074	.3996	.3933	-107.9	-110.3	-112.8	16.951	-132.9
10	18	0.0000	.0722	-.0418	.3946	.3847	.3753	-112.7	-117.8	-123.0	16.110	-133.5
11	19	0.0000	.1280	-.0739	.3784	.3584	.3312	-122.8	-133.6	-145.7	16.577	-152.5
12	20	0.0000	.1982	-.1145	.3338	.3048	.2773	-145.1	-157.8	-173.8	20.462	-179.3
		0.0000	.2310	-.1334			GAP 7			GAP 7	22.623	171.3
		0.0000	.2310	-.1334	GAP 8			GAP 8			6.343	75.0
13	21	0.0000	.2639	-.1524	.2773	.2461	.2006	-173.8	-172.2	-171.2	9.836	89.6
14	22	0.0000	.3460	-.1998	.2023	.1112	.0000	-172.2	-172.2	7.3	17.360	97.8
		-.0000	0.0000	-.0000	GAP 9			GAP 9			56.413	154.6
15	23	-.0094	0.0000	.0044	.0096	.0576	.0906	6.2	56.0	58.5	39.239	153.6
15	24	.0282	0.0000	.0131	.0840	.1050	.1204	57.8	58.4	58.4	16.814	149.8
15	25	.0469	0.0000	.0219	.1191	.1302	.1384	58.3	58.1	57.9	8.906	145.3
16	26	.0756	0.0000	.0353	.1370	.1456	.1469	57.8	57.1	56.4	2.363	128.9
17	27	.1339	0.0000	.0625	.1439	.1277	.0953	56.2	54.8	53.6	5.476	-28.8
18	28	.2101	0.0000	.0981	.0948	.0517	.0000	53.5	52.5	51.3	11.189	-36.5
		.0000	0.0000	.0000	GAP 10			GAP 10			56.413	154.6

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
19	29	-.0094	0.0000	-.0044	.0096	.0576	.0906	6.2	56.0	58.5	39.239	153.6
19	30	-.0282	0.0000	-.0131	.0840	.1050	.1204	57.8	58.4	58.4	16.814	149.8
19	31	-.0469	0.0000	-.0219	.1191	.1302	.1384	58.3	58.1	57.9	8.906	145.3
20	32	-.075[illegible]	0.0000	-.0353	.1370	.1456	.1469	57.8	57.1	56.4	2.363	128.9
21	33	-.13[illegible]	0.0000	-.0625	.1439	.1277	.0953	56.2	54.8	53.6	5.476	-28.8
22	34	-.2101	0.0000	-.0981	.0948	.0517	.0000	53.5	52.5	51.3	11.189	-36.5

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	156.115	-1020.696	.000146	.000957	0.000	0.000	152.297	-1021.876	1000.000	0.0
2	156.115	-1020.696	.000146	.000957	0.000	0.000	152.297	-1021.876	1000.000	0.0
3					INFINITE	INFINITE	-99.009	9.904	48.279	75.3
6					INFINITE	INFINITE	-99.009	9.904	48.279	75.3
9					INFINITE	INFINITE	-.000	21327.296	205.215	96.2
10					INFINITE	INFINITE	-.000	21327.296	205.215	96.2
4					INFINITE	INFINITE	-600.000	-.000	166.409	-173.8
7					INFINITE	INFINITE	-600.000	.000	166.409	-173.8

INPUT POWER = 292.845 WATTS
RADIATED POWER = 7.509 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 285.336 WATTS
RADIATION EFFICIENCY = 2.56 PER CENT

FREQUENCY = 1.1070 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 313

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 37.4 PER CENT FOR GAPS 4 AND 9

EXCITATION MODE

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	188000.0000	-0.0000	-0.0000	-0.0000
10	IMP	2- 0	188000.0000	-0.0000	-0.0000	-0.0000
11	IMP	1- 2	-386000.0000	-0.0000	-0.0000	-0.0000

WIRE NO	INT NO	COORDINATES X WAVELENGTHS	Y WAVELENGTHS	Z WAVELENGTHS	CURRENT DISTRIBUTION AMPLITUDE			PHASE			NORMAL ELECTRIC FIELD * RADIUS	
					AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			185.785	-.1
1	1	0.0000	0.0000	.0115	1.1095	.8969	.7082	89.9	89.9	89.8	166.357	-.1
1	2	0.0000	0.0000	.0346	.7210	.5445	.3682	89.8	89.8	89.8	146.251	-.1
1	3	0.0000	0.0000	.0576	.3749	.1931	.0000	89.8	89.8	-90.8	155.414	-.2
		0.0000	0.0000	0.0000	GAP 2			GAP 2			185.785	179.9
2	4	0.0000	0.0000	-.0115	1.1095	.8969	.7082	-90.1	-90.1	-90.2	166.357	179.9
2	5	0.0000	0.0000	-.0346	.7210	.5445	.3682	-90.2	-90.2	-90.2	146.251	179.9

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
2	6	0.0000	0.0000	-.0576	.3749	.1931	.0000	-90.2	-90.2	89.2	155.414	179.8
		0.0000	-.0000	-.0000	GAP 3			GAP 3			20.186	175.7
3	7	0.0000	.0100	.0058	.0736	.0527	.0386	-94.3	-94.1	-93.6	14.532	175.0
3	8	0.0000	.0299	.0173	.0410	.0315	.0242	-93.5	-92.4	-90.5	7.006	172.2
3	9	0.0000	.0499	.0289	.0247	.0192	.0149	-90.6	-87.7	-83.4	4.204	168.8
4	10	0.0000	.0803	.0465	.0156	.0102	.0076	-83.7	-70.4	-50.2	2.068	162.0
5	11	0.0000	.1424	.0823	.0090	.0084	.0088	-57.7	-36.7	-32.0	.399	138.1
6	12	0.0000	.2206	.1274	.0092	.0093	.0091	-35.4	-41.6	-54.8	.355	-48.6
		0.0000	.2570	.1485			GAP 4			GAP 4	.607	-57.6
		0.0000	.2570	.1485	GAP 5			GAP 5			.344	135.2
7	13	0.0000	.2936	.1696	.0091	.0085	.0074	-54.8	-47.0	-42.1	.284	174.2
8	14	0.0000	.3850	.2222	.0074	.0044	.0000	-44.9	-42.5	166.1	.576	-134.9
		0.0000	-.0000	.0000	GAP 6			GAP 6			20.186	-4.3
9	15	0.0000	.0100	-.0058	.0736	.0527	.0386	85.7	85.9	86.4	14.532	-5.0
9	16	0.0000	.0299	-.0173	.0410	.0315	.0242	86.5	87.6	89.5	7.006	-7.8
9	17	0.0000	.0499	-.0289	.0247	.0192	.0149	89.4	92.3	96.6	4.204	-11.2
10	18	0.0000	.0803	-.0465	.0156	.0102	.0076	96.3	109.6	129.8	2.068	-18.0
11	19	0.0000	.1424	-.0823	.0090	.0084	.0088	122.3	143.3	148.0	.399	-41.9
12	20	0.0000	.2206	-.1274	.0092	.0093	.0091	144.6	138.4	125.2	.355	131.4
		0.0000	.2570	-.1485			GAP 7			GAP 7	.607	122.4
		0.0000	.2570	-.1485	GAP 8			GAP 8			.344	-44.8
13	21	0.0000	.2936	-.1696	.0091	.0085	.0074	125.2	133.0	137.9	.284	-5.8
14	22	0.0000	.3850	-.2222	.0074	.0044	.0000	135.1	137.5	-13.9	.576	45.1
		0.0000	0.0000	0.0000	GAP 9			GAP 9			14.433	-179.7
15	23	.0104	0.0000	.0049	.0748	.0600	.0499	-100.9	-103.7	-106.5	10.612	-179.9
15	24	.0313	0.0000	.0146	.0515	.0444	.0389	-106.0	-108.5	-111.1	5.470	178.9
15	25	.0522	0.0000	.0244	.0392	.0349	.0313	-110.8	-113.2	-115.6	3.517	176.8
16	26	.0841	0.0000	.0393	.0318	.0263	.0220	-115.1	-119.1	-122.8	2.115	171.2
17	27	.1490	0.0000	.0696	.0231	.0167	.0106	-121.0	-124.8	-128.0	1.273	154.8
18	28	.2338	0.0000	.1091	.0114	.0057	.0000	-125.9	-126.8	23.0	1.208	144.1
		0.0000	0.0000	0.0000	GAP 10			GAP 10			14.433	.3
19	29	-.0104	0.0000	-.0049	.0748	.0600	.0499	79.1	76.3	73.5	10.612	.1
19	30	-.0313	0.0000	-.0146	.0515	.0444	.0389	74.0	71.5	68.9	5.470	-1.1
19	31	-.0522	0.0000	-.0244	.0392	.0349	.0313	69.2	66.8	64.4	3.517	-3.2
20	32	-.0841	0.0000	-.0393	.0318	.0263	.0220	64.9	60.9	57.2	2.115	-8.8
21	33	-.1490	0.0000	-.0696	.0231	.0167	.0106	59.0	55.2	52.0	1.273	-25.2
22	34	-.2338	0.0000	-.1091	.0114	.0057	.0000	54.1	53.2	-157.0	1.208	-35.9

OHMS	OHMS	MHOS	MHOS	OHMS	OHMS	OHMS	OHMS	VOLT	DEGREES
				INFINITE	INFINITE	-98.777	10.993	7.318	-100.6
				INFINITE	INFINITE	-.000	.000	.000	2.0
				INFINITE	INFINITE	.000	-.000	.000	2.0
				INFINITE	INFINITE	-600.000	-.000	5.433	-54.8
				INFINITE	INFINITE	-600.000	-.000	5.433	125.2

INPUT POWER = 5.477 WATTS
RADIATED POWER = 2.862 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 2.615 WATTS
RADIATION EFFICIENCY = 52.26 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT.	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

		COORDINATES			CURRENT DISTRIBUTION						NORMAL ELECTRIC FIELD * RADIUS	
		X	Y	Z	AMPLITUDE			PHASE				
WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			169.321	-8.1
1	1	0.0000	0.0000	.0115	1.0806	.8843	.7045	79.3	78.9	78.5	155.978	-9.2
1	2	0.0000	0.0000	.0346	.7145	.5421	.3680	78.6	78.4	78.2	143.629	-10.9
1	3	0.0000	0.0000	.0576	.3742	.1932	.0000	78.3	78.1	-107.6	155.108	-11.7
		0.0000	0.0000	0.0000	GAP 2			GAP 2			169.321	-8.1
2	4	0.0000	0.0000	-.0115	1.0806	.8843	.7045	79.3	78.9	78.5	155.978	-9.2
2	5	0.0000	0.0000	-.0346	.7145	.5421	.3680	78.6	78.4	78.2	143.629	-10.9
2	6	0.0000	0.0000	-.0576	.3742	.1932	.0000	78.3	78.1	-107.6	155.108	-11.7

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG.
		0.0000	-.0000	-.0000	GAP 3			GAP 3			45.385	-164.2
3	7	0.0000	.0100	.0058	.5419	.5010	.4760	-101.4	-104.2	-107.2	34.591	-156.3
3	8	0.0000	.0299	.0173	.4820	.4669	.4559	-107.0	-110.0	-113.1	23.308	-137.7
3	9	0.0000	.0499	.0289	.4572	.4490	.4424	-113.1	-116.2	-119.4	21.418	-132.8
4	10	0.0000	.0803	.0465	.4438	.4339	.4248	-119.3	-125.9	-132.5	20.554	-136.7
5	11	0.0000	.1424	.0823	.4281	.4088	.3825	-132.3	-145.9	-160.8	20.617	-159.0
6	12	0.0000	.2206	.1274	.3857	.3575	.3335	-160.2	-175.2	166.5	24.367	169.5
		0.0000	.2570	.1485		GAP 4				GAP 4	26.605	157.9
		0.0000	.2570	.1485	GAP 5			GAP 5			4.784	41.9
7	13	0.0000	.2936	.1696	.3335	.3043	.2530	166.5	168.2	169.1	9.327	68.2
8	14	0.0000	.3850	.2222	.2551	.1427	.0000	168.1	167.9	-18.5	19.775	78.1
		0.0000	-.0000	.0000	GAP 6			GAP 6			45.385	-164.2
9	15	0.0000	.0100	-.0058	.5419	.5010	.4760	-101.4	-104.2	-107.2	34.591	-156.3
9	16	0.0000	.0299	-.0173	.4820	.4669	.4559	-107.0	-110.0	-113.1	23.308	-137.7
9	17	0.0000	.0499	-.0289	.4572	.4490	.4424	-113.1	-116.2	-119.4	21.418	-132.8
10	18	0.0000	.0803	-.0465	.4438	.4339	.4248	-119.3	-125.9	-132.5	20.554	-136.7
11	19	0.0000	.1424	-.0823	.4281	.4088	.3825	-132.3	-145.9	-160.8	20.617	-159.0
12	20	0.0000	.2206	-.1274	.3857	.3575	.3335	-160.2	-175.2	166.5	24.367	169.5
		0.0000	.2570	-.1485		GAP 7				GAP 7	26.605	157.9
		0.0000	.2570	-.1485	GAP 8			GAP 8			4.784	41.9
13	21	0.0000	.2936	-.1696	.3335	.3043	.2530	166.5	168.2	169.1	9.327	68.2
14	22	0.0000	.3850	-.2222	.2551	.1427	.0000	168.1	167.9	-18.5	19.775	78.1
		0.0000	0.0000	0.0000	GAP 9			GAP 9			59.633	146.5
15	23	.0104	0.0000	.0049	.0139	.0704	.1102	2.0	46.7	49.3	41.995	145.1
15	24	.0313	0.0000	.0146	.1027	.1286	.1482	48.5	49.0	49.0	18.894	140.0
15	25	.0522	0.0000	.0244	.1467	.1612	.1722	48.8	48.6	48.2	10.596	134.4
16	26	.0841	0.0000	.0393	.1706	.1832	.1866	48.0	47.1	46.3	3.422	118.0
17	27	.1490	0.0000	.0696	.1832	.1651	.1243	46.0	44.2	42.7	6.007	-37.2
18	28	.2338	0.0000	.1091	.1238	.0679	.0000	42.6	41.3	-149.4	13.178	-47.4
		0.0000	0.0000	0.0000	GAP 10			GAP 10			59.633	146.5
19	29	-.0104	0.0000	-.0049	.0139	.0704	.1102	2.0	46.7	49.3	41.995	145.1
19	30	-.0313	0.0000	-.0146	.1027	.1286	.1482	48.5	49.0	49.0	18.894	140.0
19	31	-.0522	0.0000	-.0244	.1467	.1612	.1722	48.8	48.6	48.2	10.596	134.4
20	32	-.0841	0.0000	-.0393	.1706	.1832	.1866	48.0	47.1	46.3	3.422	118.0
21	33	-.1490	0.0000	-.0696	.1832	.1651	.1243	46.0	44.2	42.7	6.007	-37.2
22	34	-.2338	0.0000	-.1091	.1238	.0679	.0000	42.6	41.3	-149.4	13.178	-47.4

	OHMS	OHMS	MHOS	MHOS	OHMS	OHMS	OHMS	OHMS	VOLT	DEGREES
9					INFINITE	INFINITE	-.000	19169.520	266.913	92.0
10					INFINITE	INFINITE	-.000	19169.520	266.913	92.0
4					INFINITE	INFINITE	-600.000	-.000	200.072	166.5
7					INFINITE	INFINITE	-600.000	-.000	200.072	166.5

INPUT POWER = 410.779 WATTS
RADIATED POWER = 17.272 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 393.506 WATTS
RADIATION EFFICIENCY = 4.20 PER CENT

FREQUENCY = 1.3100 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 31

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 48.0 PER CENT FOR GAPS 4 AND 9.

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000

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NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	128000.0000	-0.0000	-0.0000	-0.0000
10	IMP	2- 0	128000.0000	-0.0000	-0.0000	-0.0000
11	IMP	1- 2	-264000.0000	-0.0000	-0.0000	-0.0000

		COORDINATES			CURRENT DISTRIBUTION						NORMAL ELECTRIC FIELD * RADIUS	
		X	Y	Z	AMPLITUDE			PHASE				
WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			185.841	-.1
1	1	0.0000	0.0000	.0136	1.3498	1.0967	.8698	89.8	89.8	89.8	168.215	-.1
1	2	0.0000	0.0000	.0409	.8851	.6705	.4545	89.8	89.7	89.7	150.896	-.2
1	3	0.0000	0.0000	.0682	.4627	.2387	.0000	89.7	89.7	89.1	162.145	-.3
		0.0000	0.0000	0.0000	GAP 2			GAP 2			185.841	179.9
2	4	0.0000	0.0000	-.0136	1.3498	1.0967	.8698	-90.2	-90.2	-90.2	168.215	179.9
2	5	0.0000	0.0000	-.0409	.8851	.6705	.4545	-90.2	-90.3	-90.3	150.896	179.8
2	6	0.0000	0.0000	-.0682	.4627	.2387	.0000	-90.3	-90.3	-90.9	162.145	179.7
		0.0000	0.0000	0.0000	GAP 3			GAP 3			20.242	175.0
3	7	0.0000	.0118	.0068	.0867	.0619	.0454	-93.4	-92.6	-91.2	14.518	174.2
3	8	0.0000	.0354	.0205	.0483	.0373	.0290	-91.3	-89.3	-86.3	6.850	171.2
3	9	0.0000	.0590	.0342	.0297	.0236	.0191	-86.4	-82.4	-77.2	3.954	167.8
4	10	0.0000	.0950	.0550	.0200	.0148	.0125	-77.8	-65.7	-53.7	1.721	161.6
5	11	0.0000	.1686	.0974	.0143	.0140	.0140	-59.4	-54.3	-61.2	.048	-95.8
6	12	0.0000	.2610	.1507	.0150	.0151	.0153	-62.6	-75.4	-93.5	.787	-76.4
		0.0000	.3041	.1757			GAP 4			GAP 4	1.034	-86.4
		0.0000	.3041	.1757	GAP 5			GAP 5			.456	82.6
7	13	0.0000	.3474	.2006	.0153	.0148	.0131	-93.5	-86.2	-81.9	.349	129.7
8	14	0.0000	.4556	.2630	.0133	.0080	.0000	-84.5	-82.6	106.4	.883	-174.5
		0.0000	0.0000	0.0000	GAP 6			GAP 6			20.242	-5.0
9	15	0.0000	.0118	.0068	.0867	.0619	.0454	86.6	87.4	88.8	14.518	-5.8
9	16	0.0000	.0354	-.0205	.0483	.0373	.0290	88.7	90.7	93.7	6.850	-8.8
9	17	0.0000	.0590	-.0342	.0297	.0236	.0191	93.6	97.6	102.8	3.954	-12.2
10	18	0.0000	.0950	-.0550	.0200	.0148	.0125	102.2	114.3	126.3	1.721	-18.4
11	19	0.0000	.1686	-.0974	.0143	.0140	.0140	120.6	125.7	118.8	.048	84.2
12	20	0.0000	.2610	-.1507	.0150	.0151	.0153	117.4	104.6	86.5	.787	103.6
		0.0000	.3041	-.1757			GAP 7			GAP 7	1.034	93.6
		0.0000	.3041	-.1757	GAP 8			GAP 8			.456	-97.4
13	21	0.0000	.3474	-.2006	.0153	.0148	.0131	86.5	93.8	98.1	.349	-50.3
14	22	0.0000	.4556	-.2630	.0133	.0080	.0000	95.5	97.4	-73.6	.883	5.5
		0.0000	0.0000	0.0000	GAP 9			GAP 9			14.500	-179.6
15	23	.0124	0.0000	.0058	.0861	.0684	.0563	-99.2	-101.6	-104.2	10.656	-179.9
15	24	.0371	0.0000	.0173	.0581	.0497	.0431	-103.7	-106.0	-108.3	5.452	179.1
15	25	.0618	0.0000	.0288	.0436	.0384	.0341	-108.1	-110.3	-112.4	3.463	177.1
16	26	.0995	0.0000	.0465	.0348	.0284	.0235	-112.0	-115.6	-119.0	2.032	171.9

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
17	27	.1764	0.0000	.0823	.0250	.0179	.0113	-117.1	-119.9	-122.0	1.181	157.0
18	28	.2766	0.0000	.1291	.0123	.0062	.0000	-119.8	-119.6	67.5	1.115	150.2
		0.0000	0.0000	0.0000	GAP 10			GAP 10			14.500	.4
19	29	-.0124	0.0000	-.0058	.0861	.0684	.0563	80.8	78.4	75.8	10.656	.1
19	30	-.0371	0.0000	-.0173	.0581	.0497	.0431	76.3	74.0	71.7	5.452	-.9
19	31	-.0618	0.0000	-.0288	.0436	.0384	.0341	71.9	69.7	67.6	3.463	-2.9
20	32	-.0995	0.0000	-.0465	.0348	.0284	.0235	68.0	64.4	61.0	2.032	-8.1
21	33	-.1764	0.0000	-.0823	.0250	.0179	.0113	62.9	60.1	58.0	1.181	-23.0
22	34	-.2766	0.0000	-.1291	.0123	.0062	.0000	60.2	60.4	-112.5	1.115	-29.8

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	2.707	-740.843	.000005	.001350	0.000	0.000	2.577	-740.844	1000.000	0.0
2	2.707	-740.843	.000005	.001350	0.000	0.000	2.577	-740.844	1000.000	-180.0
3					INFINITE	INFINITE	-98.295	12.945	8.600	79.1
6					INFINITE	INFINITE	-98.295	12.945	8.600	-100.9
9					INFINITE	INFINITE	-.000	.000	.000	-3.9
10					INFINITE	INFINITE	.000	-.000	.000	-3.9
4					INFINITE	INFINITE	-600.000	-.000	9.166	-93.5
7					INFINITE	INFINITE	-600.000	-.000	9.166	86.5

INPUT POWER = 9.865 WATTS
RADIATED POWER = 5.873 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 3.992 WATTS
RADIATION EFFICIENCY = 59.53 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

		COORDINATES			CURRENT DISTRIBUTION					NORMAL ELECTRIC FIELD * RADIUS	
		X	Y	Z	AMPLITUDE			PHASE			
WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			167.059	-10.3
1	1	0.0000	0.0000	.0136	1.2805	1.0506	.8389	76.8	76.3	75.9	154.848	-11.5
1	2	0.0000	0.0000	.0409	.8509	.6467	.4395	76.0	75.8	75.6	144.175	-13.5
1	3	0.0000	0.0000	.0682	.4469	.2308	.0000	75.6	75.5	71.3	156.595	-14.4
		0.0000	0.0000	0.0000	GAP 2			GAP 2			167.059	-10.3
2	4	0.0000	0.0000	-.0136	1.2805	1.0506	.8389	76.8	76.3	75.9	154.848	-11.5
2	5	0.0000	0.0000	-.0409	.8509	.6467	.4395	76.0	75.8	75.6	144.175	-13.5
2	6	0.0000	0.0000	-.0682	.4469	.2308	.0000	75.6	75.5	71.3	156.595	-14.4
		0.0000	0.0000	0.0000	GAP 3			GAP 3			48.516	-160.1
3	7	0.0000	.0118	.0068	.6421	.5935	.5628	-104.2	-107.8	-111.6	39.002	-153.3
3	8	0.0000	.0354	.0205	.5695	.5497	.5342	-111.4	-115.2	-119.2	28.915	-140.6
3	9	0.0000	.0590	.0342	.5356	.5232	.5125	-119.1	-123.1	-127.3	27.271	-140.5
4	10	0.0000	.0950	.0550	.5141	.4959	.4793	-127.2	-135.8	-144.7	26.614	-148.7
5	11	0.0000	.1686	.0974	.4828	.4511	.4214	-144.4	-163.4	175.5	27.025	-175.0
6	12	0.0000	.2610	.1507	.4259	.4042	.3989	176.2	155.6	132.5	30.036	149.7
		0.0000	.3041	.1757			GAP 4			GAP 4	31.559	135.0
		0.0000	.3041	.1757	GAP 5			GAP 5			3.599	-75.0
7	13	0.0000	.3474	.2006	.3989	.3872	.3359	132.5	134.3	135.2	6.347	28.3
8	14	0.0000	.4556	.2630	.3384	.1963	.0000	134.0	133.6	-48.6	22.408	44.0
		0.0000	0.0000	0.0000	GAP 6			GAP 6			48.516	-160.1
9	15	0.0000	.0118	-.0068	.6421	.5935	.5628	-104.2	-107.8	-111.6	39.002	-153.3
9	16	0.0000	.0354	-.0205	.5695	.5497	.5342	-111.4	-115.2	-119.2	28.915	-140.6
9	17	0.0000	.0590	-.0342	.5356	.5232	.5125	-119.1	-123.1	-127.3	27.271	-140.5
10	18	0.0000	.0950	-.0550	.5141	.4959	.4793	-127.2	-135.8	-144.7	26.614	-148.7
11	19	0.0000	.1686	-.0974	.4828	.4511	.4214	-144.4	-163.4	175.5	27.025	-175.0
12	20	0.0000	.2610	-.1507	.4259	.4042	.3989	176.2	155.6	132.5	30.036	149.7
		0.0000	.3041	-.1757			GAP 7			GAP 7	31.559	135.0
		0.0000	.3041	-.1757	GAP 8			GAP 8			3.599	-75.0
13	21	0.0000	.3474	-.2006	.3989	.3872	.3359	132.5	134.3	135.2	6.347	28.3
14	22	0.0000	.4556	-.2630	.3384	.1963	.0000	134.0	133.6	-48.6	22.408	44.0
		0.0000	0.0000	0.0000	GAP 9			GAP 9			64.793	135.3
15	23	.0124	0.0000	.0058	.0219	.0957	.1495	-3.9	34.6	37.1	46.900	133.2
15	24	.0371	0.0000	.0173	.1406	.1778	.2071	36.2	36.4	36.2	23.320	126.2
15	25	.0618	0.0000	.0288	.2053	.2283	.2464	36.0	35.5	35.0	14.478	119.7
16	26	.0995	0.0000	.0465	.2446	.2683	.2780	34.8	33.5	32.4	6.018	105.7
17	27	.1764	0.0000	.0823	.2741	.2542	.1943	32.1	29.9	28.2	6.974	-48.6
18	28	.2766	0.0000	.1291	.1944	.1072	.0000	28.0	26.6	-165.8	17.580	-62.0
		0.0000	0.0000	0.0000	GAP 10			GAP 10			64.793	135.3

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WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
19	29	-.0124	0.0000	-.0058	.0219	.0957	.1495	-3.9	34.6	37.1	46.900	133.2
19	30	-.0371	0.0000	-.0173	.1406	.1778	.2071	36.2	36.4	36.2	23.320	126.2
19	31	-.0618	0.0000	-.0288	.2053	.2283	.2464	36.0	35.5	35.0	14.478	119.7
20	32	-.0995	0.0000	-.0465	.2446	.2683	.2780	34.8	33.5	32.4	6.018	105.7
21	33	-.1764	0.0000	-.0823	.2741	.2542	.1943	32.1	29.9	28.2	6.974	-48.6
22	34	-.2766	0.0000	-.1291	.1944	.1072	.0000	28.0	26.6	-165.8	17.580	-62.0

IMPEDANCE DATA

GAP NO.	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	DEGREES
1	182.942	-758.098	.000301	.001247	0.000	0.000	178.695	-760.243	1000.000	0.0
2	182.942	-758.098	.000301	.001247	0.000	0.000	178.695	-760.243	1000.000	0.0
3					INFINITE	INFINITE	-98.295	12.945	63.660	68.3
6					INFINITE	INFINITE	-98.295	12.945	63.660	68.3
9					INFINITE	INFINITE	-.000	16198.976	354.856	86.1
10					INFINITE	INFINITE	-.000	16198.976	354.856	86.1
4					INFINITE	INFINITE	-600.000	.000	239.338	132.5
7					INFINITE	INFINITE	-600.000	-.000	239.338	132.5

INPUT POWER = 601.606 WATTS
RADIATED POWER = 41.995 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 559.611 WATTS
RADIATION EFFICIENCY = 6.98 PER CENT

WIRE COORDINATES IN FEET AND WIRE RADII IN INCHE

WIRE NO		X1	Y1	Z1	RAD1		X2	Y2	Z2	RAD2	INTERVALS
1	GAP 1	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	61.5000	.250000	3
2	GAP 2	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	61.5000	.250000	3
3	GAP 3	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	30.8000	.250000	3
4		-0.0000	53.2000	30.8000	.250000		-0.0000	89.6000	51.8000	.250000	1
5		-0.0000	89.6000	51.8000	.250000		-0.0000	163.7000	94.5000	.250000	1
6		-0.0000	163.7000	94.5000	.250000	G	-0.0000	228.5000	132.0000	.250000	1
7	GAP 5	-0.0000	228.5000	132.0000	.250000		-0.0000	293.6000	169.5000	.250000	1
8		-0.0000	293.6000	169.5000	.250000		-0.0000	391.0000	225.7000	.250000	2
9	GAP 6	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	-30.8000	.250000	3
10		-0.0000	53.2000	-30.8000	.250000		-0.0000	89.6000	-51.8000	.250000	1
11		-0.0000	89.6000	-51.8000	.250000		-0.0000	163.7000	-94.5000	.250000	1
12		-0.0000	163.7000	-94.5000	.250000	G	-0.0000	228.5000	-132.0000	.250000	1
13	GAP 8	-0.0000	228.5000	-132.0000	.250000		-0.0000	293.6000	-169.5000	.250000	1

WIRE NO		X1	Y1	Z1	RAD1	X2	Y2	Z2	RAD2	INTERVALS
14		-0.0000	293.6000	-169.5000	.250000	-0.0000	391.0000	-225.7000	.250000	2
15	GAP 9	-0.0000	-0.0000	-0.0000	.290000	55.7000	-0.0000	26.0000	.290000	3
16		55.7000	-0.0000	26.0000	.290000	93.8000	-0.0000	43.8000	.290000	1
17		93.8000	-0.0000	43.8000	.290000	171.2000	-0.0000	79.9000	.290000	1
18		171.2000	-0.0000	79.9000	.290000	244.5000	-0.0000	114.1000	.290000	1
19	GAP 10	-0.0000	-0.0000	-0.0000	.290000	-55.7000	-0.0000	-26.0000	.290000	3
20		-55.7000	-0.0000	-26.0000	.290000	-93.8000	-0.0000	-43.8000	.290000	1
21		-93.8000	-0.0000	-43.8000	.290000	-171.2000	-0.0000	-79.9000	.290000	1
22		-171.2000	-0.0000	-79.9000	.290000	-244.5000	-0.0000	-114.1000	.290000	1

FREQUENCY = 1.6500 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 315

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 7.6 PER CENT FOR GAPS 3 AND 1

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

ET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	182000.0000	-0.0000	-0.0000	-0.0000
10	IMP	2- 0	182000.0000	-0.0000	-0.0000	-0.0000
11	IMP	1- 2	-403000.0000	-0.0000	-0.0000	-0.0000

WIRE NO	INT NO	COORDINATES WAVELENGTHS	Y WAVELENGTHS	Z WAVELENGTHS	CURRENT DISTRIBUTION AMPLITUDE			PHASE			NORMAL ELECTRIC FIELD * RADIUS VOLTS	DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1			185.984	-.1
1	1	0.0000	0.0000	.0172	1.8066	1.4838	1.1872	89.6	89.5	89.5	172.452	-.2
1	2	0.0000	0.0000	.0515	1.2070	.9202	.6267	89.5	89.4	89.4	161.553	-.4
1	3	0.0000	0.0000	.0859	.6380	.3300	.0000	89.4	89.4	-91.9	177.616	-.6
		0.0000	0.0000	.0000	GAP 2			GAP 2			185.984	179.9
2	4	0.0000	0.0000	-.0172	1.8066	1.4838	1.1872	-90.4	-90.5	-90.5	172.452	179.8
2	5	0.0000	0.0000	-.0515	1.2070	.9202	.6267	-90.5	-90.6	-90.6	161.553	179.6
2	6	0.0000	0.0000	-.0859	.6380	.3300	.0000	-90.6	-90.6	88.1	177.616	179.4
		0.0000	0.0000	0.0000	GAP 3			GAP 3			20.563	172.8
3	7	0.0000	.0149	.0086	.1247	.0936	.0734	-87.6	-84.3	-80.2	14.718	172.1
3	8	0.0000	.0446	.0258	.0771	.0640	.0545	-80.9	-76.9	-72.5	6.818	170.1
3	9	0.0000	.0743	.0430	.0553	.0485	.0435	-72.8	-68.7	-64.8	3.824	170.9
4	10	0.0000	.1197	.0692	.0447	.0382	.0335	-65.6	-60.6	-59.0	1.636	-174.3
5	11	0.0000	.2123	.1226	.0365	.0304	.0249	-62.2	-72.5	-97.4	1.487	-110.6
6	12	0.0000	.3287	.1899	.0271	.0260	.0299	-96.9	-127.0	-157.5	2.254	-122.5
		0.0000	.3831	.2213			GAP 4			GAP 4	2.314	-133.5
		0.0000	.3831	.2213	GAP 5			GAP 5			.940	-32.2
7	13	0.0000	.4376	.2527	.0299	.0328	.0312	-157.5	-152.6	-150.6	.303	5.5
8	14	0.0000	.5330	.3077	.0315	.0270	.0200	-151.4	-150.8	-150.5	1.178	117.0
8	15	0.0000	.6147	.3548	.0204	.0111	.0000	-150.8	-150.8	29.8	2.094	119.2
		0.0000	0.0000	0.0000	GAP 6			GAP 6			20.563	-7.2
9	16	0.0000	.0149	-.0086	.1247	.0936	.0734	92.4	95.7	99.8	14.718	-7.9
9	17	0.0000	.0446	-.0258	.0771	.0640	.0545	99.1	103.1	107.5	6.818	-9.9
9	18	0.0000	.0743	-.0430	.0553	.0485	.0435	107.2	111.3	115.2	3.824	-9.1
10	19	0.0000	.1197	-.0692	.0447	.0382	.0335	114.4	119.4	121.0	1.636	5.7
11	20	0.0000	.2123	-.1226	.0365	.0304	.0249	117.8	107.5	82.6	1.487	69.4
12	21	0.0000	.3287	-.1899	.0271	.0260	.0299	83.1	53.0	22.5	2.254	57.5
		0.0000	.3831	-.2213			GAP 7			GAP 7	2.314	46.5
		0.0000	.3831	-.2213	GAP 8			GAP 8			.940	147.8
13	22	0.0000	.4376	-.2527	.0299	.0328	.0312	22.5	27.4	29.4	.303	-174.5
14	23	0.0000	.5330	-.3077	.0315	.0270	.0200	28.6	29.2	29.5	1.178	-63.0
14	24	0.0000	.6147	-.3548	.0204	.0111	.0000	29.2	29.2	-150.2	2.094	-60.8
		0.0000	0.0000	0.0000	GAP 9			GAP 9			14.643	-179.5
15	25	.0156	0.0000	.0073	.1065	.0842	.0691	-100.6	-103.5	-106.6	10.725	-179.8
15	26	.0467	0.0000	.0218	.0715	.0611	.0531	-106.0	-108.6	-111.2	5.355	178.6
15	27	.0778	0.0000	.0363	.0537	.0476	.0426	-110.9	-113.3	-115.5	3.270	175.9
16	28	.1253	0.0000	.0585	.0435	.0364	.0309	-114.9	-118.1	-120.4	1.799	168.1

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	4.018	-553.506	.000013	.001807	0.000	0.000	3.856	-553.508	1000.000	0.0
2	4.018	-553.506	.000013	.001807	0.000	0.000	3.856	-553.508	1000.000	-180.0
3					INFINITE	INFINITE	-97.322	16.143	12.305	83.0
6					INFINITE	INFINITE	-97.322	16.143	12.305	-97.0
9					INFINITE	INFINITE	-.000	.000	.000	-9.2
10					INFINITE	INFINITE	.000	-.000	.000	-9.2
4					INFINITE	INFINITE	-600.000	-.000	17.917	-157.5
7					INFINITE	INFINITE	-600.000	-.000	17.917	22.5

INPUT POWER = 26.231 WATTS
RADIATED POWER = 16.972 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 9.260 WATTS
RADIATION EFFICIENCY = 64.70 PER CENT

EXCITATION MODE

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

		COORDINATES			CURRENT DISTRIBUTION			NORMAL ELECTRIC FIELD * RADIUS				
		X	Y	Z	AMPLITUDE			PHASE				
WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1			166.943	-21.9
1	1	0.0000	0.0000	.0172	1.6793	1.3871	1.1136	68.4	68.5	68.6	157.487	-21.8
1	2	0.0000	0.0000	.0515	1.1296	.8620	.5874	68.5	68.6	68.6	150.965	-21.5
1	3	0.0000	0.0000	.0859	.5974	.3090	.0000	68.6	68.6	-110.7	166.325	-21.4
		0.0000	0.0000	.0000	GAP 2			GAP 2			166.943	-21.9
2	4	0.0000	0.0000	-.0172	1.6793	1.3871	1.1136	68.4	68.5	68.6	157.487	-21.8
2	5	0.0000	0.0000	-.0515	1.1296	.8620	.5874	68.5	68.6	68.6	150.965	-21.5
2	6	0.0000	0.0000	-.0859	.5974	.3090	.0000	68.6	68.6	-110.7	166.325	-21.4
		0.0000	0.0000	0.0000	GAP 3			GAP 3			67.452	-138.4
3	7	0.0000	.0149	.0086	.8486	.8106	.7934	-114.1	-121.3	-127.5	55.759	-136.7
3	8	0.0000	.0446	.0258	.7989	.7912	.7861	-126.9	-132.4	-137.4	40.593	-137.2
3	9	0.0000	.0743	.0430	.7872	.7823	.7758	-137.3	-142.1	-146.7	35.888	-147.1
4	10	0.0000	.1197	.0692	.7769	.7550	.7181	-146.6	-155.7	-165.0	33.590	-169.5
5	11	0.0000	.2123	.1226	.7195	.6031	.4833	-164.6	173.8	142.4	39.713	147.4
6	12	0.0000	.3287	.1899	.4906	.4559	.5294	142.9	106.1	71.0	46.838	109.9
		0.0000	.3831	.2213			GAP 4			GAP 4	45.934	93.5
		0.0000	.3831	.2213	GAP 5			GAP 5			19.125	174.3
7	13	0.0000	.4376	.2527	.5294	.6053	.5812	71.0	72.9	73.2	4.352	-175.7
8	14	0.0000	.5330	.3077	.5816	.4992	.3692	72.5	72.2	71.9	21.843	-16.4
8	15	0.0000	.6147	.3548	.3740	.2026	.0000	71.7	71.3	-123.6	38.451	-18.3
		0.0000	0.0000	0.0000	GAP 6			GAP 6			67.452	-138.4
9	16	0.0000	.0149	-.0086	.8486	.8106	.7934	-114.1	-121.3	-127.5	55.759	-136.7
9	17	0.0000	.0446	-.0258	.7989	.7912	.7861	-126.9	-132.4	-137.4	40.593	-137.2
9	18	0.0000	.0743	-.0430	.7872	.7823	.7758	-137.3	-142.1	-146.7	35.888	-147.1
10	19	0.0000	.1197	-.0692	.7769	.7550	.7181	-146.6	-155.7	-165.0	33.590	-169.5
11	20	0.0000	.2123	-.1226	.7195	.6031	.4833	-164.6	173.8	142.4	39.713	147.4
12	21	0.0000	.3287	-.1899	.4906	.4559	.5294	142.9	106.1	71.0	46.838	109.9
		0.0000	.3831	-.2213			GAP 7			GAP 7	45.934	93.5
		0.0000	.3831	-.2213	GAP 8			GAP 8			19.125	174.3
13	22	0.0000	.4376	-.2527	.5294	.6053	.5812	71.0	72.9	73.2	4.352	-175.7
14	23	0.0000	.5330	-.3077	.5816	.4992	.3692	72.5	72.2	71.9	21.843	-16.4
14	24	0.0000	.6147	-.3548	.3740	.2026	.0000	71.7	71.3	-123.6	38.451	-18.3
		0.0000	0.0000	0.0000	GAP 9			GAP 9			146.748	100.9
15	25	.0156	0.0000	.0073	.0759	.3130	.5045	-9.2	5.2	5.5	120.209	98.1
15	26	.0467	0.0000	.0218	.4873	.6459	.7870	4.9	4.3	3.7	83.561	91.7
15	27	.0778	0.0000	.0363	.7841	.9091	1.0193	3.6	2.9	2.3	65.741	88.1
16	28	.1253	0.0000	.0585	1.0167	1.1943	1.3065	2.2	1.1	.2	39.958	83.2
17	29	.2221	0.0000	.1037	1.3016	1.3145	1.0553	-.0	-1.5	-2.6	17.376	-79.1

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
18	30	.3484	0.0000	.1626	1.0685	.6048	.0000	-2.7	-3.6	-5.6	77.571	-92.7
		0.0000	0.0000	0.0000	GAP 10			GAP 10			146.748	100.9
19	31	-.0156	0.0000	-.0073	.0759	.3130	.5045	-9.2	5.2	5.5	120.209	98.1
19	32	-.0467	0.0000	-.0218	.4873	.6459	.7870	4.9	4.3	3.7	83.561	91.7
19	33	-.0778	0.0000	-.0363	.7841	.9091	1.0193	3.6	2.9	2.3	65.741	88.1
20	34	-.1253	0.0000	-.0585	1.0167	1.1943	1.3065	2.2	1.1	.2	39.958	83.2
21	35	-.2221	0.0000	-.1037	1.3016	1.3145	1.0553	-.0	-1.5	-2.6	17.376	-79.1
22	36	-.3484	0.0000	-.1626	1.0685	.6048	.0000	-2.7	-3.6	-5.6	77.571	-92.7

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	DEGREES
1	220.165	-552.521	.000622	.001562	0.000	0.000	218.748	-553.855	1000.000	0.0
2	220.165	-552.521	.000622	.001562	0.000	0.000	218.748	-553.855	1000.000	0.0
3					INFINITE	INFINITE	-97.322	16.143	83.715	56.5
6					INFINITE	INFINITE	-97.322	16.143	83.715	56.5
9					INFINITE	INFINITE	-.000	12861.006	975.732	80.8
10					INFINITE	INFINITE	-.000	12861.006	975.732	80.8
4					INFINITE	INFINITE	-600.000	-.000	317.657	71.0
7					INFINITE	INFINITE	-600.000	.000	317.657	71.0

INPUT POWER = 1244.742 WATTS
RADIATED POWER = 280.717 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 964.025 WATTS
RADIATION EFFICIENCY = 22.55 PER CENT

WIRE COORDINATES IN FEET AND WIRE RADII IN INCHES

WIRE NO			X1	Y1	Z1	RAD1		X2	Y2	Z2	RAD2	INTERVALS
1	GAP	1	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	61.5000	.250000	3
2	GAP	2	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	-61.5000	.250000	3
3	GAP	3	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	30.8000	.250000	3
4			-0.0000	53.2000	30.8000	.250000		-0.0000	89.6000	51.8000	.250000	1
5			-0.0000	89.6000	51.8000	.250000		-0.0000	163.7000	94.5000	.250000	2
6			-0.0000	163.7000	94.5000	.250000	GAP 4	-0.0000	228.5000	132.0000	.250000	2
7	GAP	5	-0.0000	228.5000	132.0000	.250000		-0.0000	293.6000	169.5000	.250000	2
8			-0.0000	293.6000	169.5000	.250000		-0.0000	391.0000	225.7000	.250000	2
9	GAP	6	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	-30.8000	.250000	3
10			-0.0000	53.2000	-30.8000	.250000		-0.0000	89.6000	-51.8000	.250000	1
11			-0.0000	89.6000	-51.8000	.250000		-0.0000	163.7000	-94.5000	.250000	2

WIRE NO		X1	Y1	Z1	RAD1		X2	Y2	Z2	RAD2	INTERVALS
12		-0.0000	163.7000	-94.5000	.250000	GAP 7	-0.0000	228.5000	-132.0000	.250000	2
13	GAP 8	-0.0000	228.5000	-132.0000	.250000		-0.0000	293.6000	-169.5000	.250000	2
14		-0.0000	293.6000	-169.5000	.250000		-0.0000	391.0000	-225.7000	.250000	2
15	GAP 9	-0.0000	-0.0000	-0.0000	.290000		55.7000	-0.0000	26.0000	.290000	3
16		55.7000	-0.0000	26.0000	.290000		93.8000	-0.0000	43.8000	.290000	1
17		93.8000	-0.0000	43.8000	.290000		171.2000	-0.0000	79.9000	.290000	2
18		171.2000	-0.0000	79.9000	.290000		244.5000	-0.0000	114.1000	.290000	2
19	GAP 10	-0.0000	-0.0000	-0.0000	.290000		-55.7000	-0.0000	-26.0000	.290000	3
20		-55.7000	-0.0000	-26.0000	.290000		-93.8000	-0.0000	-43.8000	.290000	1
21		-93.8000	-0.0000	-43.8000	.290000		-171.2000	-0.0000	-79.9000	.290000	2
22		-171.2000	-0.0000	-79.9000	.290000		-244.5000	-0.0000	-114.1000	.290000	2

FREQUENCY = 2.2000 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 316

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 33.8 PER CENT FOR GAPS 4 AND 2

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000
9	IMP	1- 0	54900.0000	-0.0000	-0.0000	-0.0000
10	IMP	2- 0	54900.0000	-0.0000	-0.0000	-0.0000
11	IMP	1- 2	-127000.0000	-0.0000	-0.0000	-0.0000

WIRE NO	INT NO	COORDINATES X WAVELENGTHS	COORDINATES Y WAVELENGTHS	COORDINATES Z WAVELENGTHS	CURRENT DISTRIBUTION AMPLITUDE			CURRENT DISTRIBUTION PHASE			NORMAL ELECTRIC FIELD * RADIUS VOLTS	NORMAL ELECTRIC FIELD * RADIUS DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			185.971	-.1
1	1	0.0000	0.0000	-.0229	2.7978	2.3538	1.9199	-89.0	-88.9	-88.8	183.600	-.4
1	2	0.0000	0.0000	.0687	1.9477	1.5053	1.0357	88.8	88.7	88.6	190.727	-1.0
1	3	0.0000	0.0000	.1146	1.0538	.5486	.0000	88.6	88.5	86.8	220.380	-1.4
		0.0000	0.0000	0.0000	GAP 2			GAP 2			185.971	179.9
2	4	0.0000	0.0000	-.0229	2.7978	2.3538	1.9199	-91.0	-91.1	-91.2	183.600	179.6
2	5	0.0000	0.0000	-.0687	1.9477	1.5053	1.0357	-91.2	-91.3	-91.4	190.727	179.0
2	6	0.0000	0.0000	-.1146	1.0538	.5486	.0000	-91.4	-91.5	-93.2	220.380	178.6
		0.0000	-.0000	-.0000	GAP 3			GAP 3			19.814	169.9
3	7	0.0000	.0198	.0115	.1825	.1424	.1169	-105.9	-107.3	-107.9	13.764	167.7
3	8	0.0000	.0595	.0344	.1223	.1066	.0959	-107.4	-107.0	-106.0	5.545	157.6
3	9	0.0000	.0991	.0574	.0973	.0903	.0858	-105.8	-104.3	-102.5	2.658	141.0
4	10	0.0000	.1596	.0923	.0880	.0847	.0831	-102.3	-98.7	-96.3	1.059	109.3
5	11	0.0000	.2417	.1396	.0859	.0831	.0765	-96.3	-95.4	-96.2	.957	172.5
5	12	0.0000	.3245	.1874	.0777	.0666	.0514	-96.4	-99.1	-105.2	2.843	-170.1
6	13	0.0000	.4021	.2322	.0519	.0365	.0231	-105.4	-117.0	-146.3	4.346	-171.6
6	14	0.0000	.4745	.2741	.0237	.0229	.0365	-146.0	160.1	126.9	4.909	-177.0
		0.0000	.5107	.2950			GAP 4			GAP 4	4.810	179.1
		0.0000	.5107	.2950	GAP 5			GAP 5			3.694	-134.2
7	15	0.0000	.5471	.3160	.0365	.0514	.0634	126.9	129.2	129.8	3.112	-136.3
7	16	0.0000	.6199	.3579	.0636	.0716	.0750	129.4	129.5	129.5	1.314	-140.3
8	17	0.0000	.7107	.4103	.0752	.0709	.0557	129.4	129.2	129.0	1.526	40.5
8	18	0.0000	.8195	.4731	.0567	.0318	.0000	128.8	128.5	129.0	4.424	38.8
		0.0000	-.0000	.0000	GAP 6			GAP 6			19.814	-10.1
9	19	0.0000	.0198	-.0115	.1825	.1424	.1169	74.1	72.7	72.1	13.764	-12.3
9	20	0.0000	.0595	-.0344	.1223	.1066	.0959	72.6	73.0	74.0	5.545	-22.4
9	21	0.0000	.0991	-.0574	.0973	.0903	.0858	74.2	75.7	77.5	2.658	-39.0
10	22	0.0000	.1596	-.0923	.0880	.0847	.0831	77.7	81.3	83.7	1.059	-70.7
11	23	0.0000	.2417	-.1396	.0859	.0831	.0765	83.7	84.6	83.8	.957	-7.5
11	24	0.0000	.3245	-.1874	.0777	.0666	.0514	83.6	80.9	74.8	2.843	9.9
12	25	0.0000	.4021	-.2322	.0519	.0365	.0231	74.6	63.0	33.7	4.346	8.4
12	26	0.0000	.4745	-.2741	.0237	.0229	.0365	34.0	-19.9	-53.1	4.909	3.0
		0.0000	.5107	-.2950			GAP 7			GAP 7	4.810	-.9
		0.0000	.5107	-.2950	GAP 8			GAP 8			3.694	45.8
13	27	0.0000	.5471	-.3160	.0365	.0514	.0634	-53.1	-50.8	-50.2	3.112	43.7

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
13	28	0.0000	.6199	-.3579	.0636	.0716	.0750	-50.6	-50.5	-50.5	1.314	-39.7
14	29	0.0000	.7107	-.4103	.0752	.0709	.0557	-50.6	-50.8	-51.0	1.526	-139.5
14	30	0.0000	.8195	-.4731	.0567	.0318	.0000	-51.2	-51.5	-51.0	4.424	-141.2
		-.0000	0.0000	-.0000	GAP 9			GAP 9			15.120	-179.6
15	31	.0208	0.0000	.0097	.1174	.0876	.0689	-103.4	-108.2	-113.4	10.658	-179.9
15	32	.0623	0.0000	.0291	.0723	.0610	.0539	-112.2	-116.4	-119.9	4.230	178.8
15	33	.1038	0.0000	.0484	.0548	.0508	.0488	-119.3	-121.6	-122.6	1.415	175.0
16	34	.1671	0.0000	.0780	.0503	.0511	.0546	-121.6	-120.0	-116.7	.639	16.7
17	35	.2529	0.0000	.1181	.0566	.0606	.0627	-115.9	-112.7	-110.1	.874	22.4
17	36	.3394	0.0000	.1584	.0637	.0624	.0570	-110.0	-108.0	-106.6	.769	134.0
18	37	.4236	0.0000	.1977	.0575	.0483	.0352	-106.7	-105.8	-105.1	2.393	160.7
18	38	.5055	0.0000	.2359	.0360	.0194	.0000	-105.3	-104.9	123.8	3.852	164.7
		.0000	0.0000	.0000	GAP 10			GAP 10			15.120	.4
19	39	-.0208	0.0000	-.0097	.1174	.0876	.0689	76.6	71.8	66.6	10.658	.1
19	40	-.0623	0.0000	-.0291	.0723	.0610	.0539	67.8	63.6	60.1	4.230	-1.2
19	41	-.1038	0.0000	-.0484	.0548	.0508	.0488	60.7	58.4	57.4	1.415	-5.0
20	42	-.1671	0.0000	-.0780	.0503	.0511	.0546	58.4	60.0	63.3	.639	-163.3
21	43	-.2529	0.0000	-.1181	.0566	.0606	.0627	64.1	67.3	69.9	.874	-157.6
21	44	-.3394	0.0000	-.1584	.0637	.0624	.0570	70.0	72.0	73.4	.769	-46.0
22	45	-.4236	0.0000	-.1977	.0575	.0483	.0352	73.3	74.2	74.9	2.393	-19.3
22	46	-.5055	0.0000	-.2359	.0360	.0194	.0000	74.7	75.1	-56.2	3.852	-15.3

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	6.263	-357.360	.000049	.002797	0.000	0.000	5.948	-357.371	1000.000	0.0
2	6.263	-357.360	.000049	.002797	0.000	0.000	5.948	-357.371	1000.000	-180.0
3					INFINITE	INFINITE	-95.337	21.085	17.823	61.6
6					INFINITE	INFINITE	-95.337	21.085	17.823	-118.4
9					INFINITE	INFINITE	.000	.000	.000	-67.6
10					INFINITE	INFINITE	-.000	-.000	.000	-67.6
4					INFINITE	INFINITE	-600.000	-.000	21.888	126.9
7					INFINITE	INFINITE	-600.000	-.000	21.888	-53.1

INPUT POWER = 98.053 WATTS
RADIATED POWER = 77.219 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 20.833 WATTS
RADIATION EFFICIENCY = 78.75 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	0.0000	0.0000	INFINITY	SERIES
2	1000.0000	-0.00	0.0000	0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

WIRE NO	INT NO	WAVE-LENGTHS	COORDINATES X	COORDINATES Y	COORDINATES Z	CURRENT DISTRIBUTION AMPLITUDE			CURRENT DISTRIBUTION PHASE			NORMAL ELECTRIC FIELD * RADIUS VOLTS	NORMAL ELECTRIC FIELD * RADIUS DEG
		0.0000	0.0000	0.0000	GAP 1								
1	1	0.0000	0.0000	.0229	1.3465	1.1428	.9448	34.9	28.1	23.3	96.565	-30.9	
1	2	0.0000	0.0000	.0687	.9515	.7412	.5142	25.0	22.1	19.7	92.421	-58.9	
1	3	0.0000	0.0000	.1146	.5216	.2731	.0000	20.2	18.5	-7.3	109.080	-69.8	
		0.0000	0.0000	0.0000	GAP 2				GAP 2			114.183	-15.6
2	4	0.0000	0.0000	-.0229	1.3465	1.1428	.9448	34.9	28.1	23.3	96.565	-30.9	
2	5	0.0000	0.0000	-.0687	.9515	.7412	.5142	25.0	22.1	19.7	92.421	-58.9	
2	6	0.0000	0.0000	-.1146	.5216	.2731	.0000	20.2	18.5	-7.3	109.080	-69.8	
		0.0000	-.0000	-.0000	GAP 3							95.036	-164.8
3	7	0.0000	.0198	.0115	.6673	.6465	.7242	-147.7	-168.2	172.3	100.041	-161.3	
3	8	0.0000	.0595	.0344	.7326	.8799	1.0608	172.6	158.3	148.4	103.192	-158.9	
3	9	0.0000	.0991	.0574	1.0631	1.2548	1.4424	148.5	141.7	136.7	95.632	-161.8	
4	10	0.0000	.1596	.0923	1.4455	1.7798	2.0016	136.7	129.7	124.9	67.861	-172.0	
5	11	0.0000	.2417	.1396	2.0057	2.0847	2.0022	124.9	120.9	116.9	28.350	120.2	
5	12	0.0000	.3245	.1874	2.0050	1.7656	1.3917	117.0	112.5	106.2	69.800	49.1	
6	13	0.0000	.4021	.2322	1.3941	.9908	.5860	106.2	96.7	74.0	109.864	35.4	
6	14	0.0000	.4745	.2741	.5946	.4362	.7455	73.8	13.9	-30.8	122.928	26.5	
		0.0000	.5107	.2950			GAP 4			GAP 4	119.289	21.4	
		0.0000	.5107	.2950	GAP 5				GAP 5			94.876	59.1
7	15	0.0000	.5471	.3160	.7455	1.1313	1.4377	-30.8	-31.3	-32.2	79.701	56.3	
7	16	0.0000	.6199	.3579	1.4377	1.6442	1.7362	-32.6	-33.5	-34.2	34.698	48.4	
8	17	0.0000	.7107	.4103	1.7382	1.6483	1.2969	-34.3	-35.1	-35.9	34.571	-119.6	

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
8	18	0.0000	.8195	.4731	1.3169	.7379	.0000	-36.0	-36.6	-35.5	102.714	-126.0
		0.0000	-.0000	.0000	GAP 6			GAP 6			95.036	-164.8
9	19	0.0000	.0198	-.0115	.6673	.6465	.7242	-147.7	-168.2	172.3	100.041	-161.3
9	20	0.0000	.0595	-.0344	.7326	.8799	1.0608	172.6	158.3	148.4	103.192	-158.9
9	21	0.0000	.0991	-.0574	1.0631	1.2548	1.4424	148.5	141.7	136.7	95.632	-161.8
10	22	0.0000	.1596	-.0923	1.4455	1.7798	2.0016	136.7	129.7	124.9	67.861	-172.0
11	23	0.0000	.2417	-.1396	2.0057	2.0847	2.0022	124.9	120.9	116.9	28.350	120.2
11	24	0.0000	.3245	-.1874	2.0050	1.7656	1.3917	117.0	112.5	106.2	69.800	49.1
12	25	0.0000	.4021	-.2322	1.3941	.9908	.5860	106.2	96.7	74.0	109.864	35.4
12	26	0.0000	.4745	-.2741	.5946	.4362	.7455	73.8	13.9	-30.8	122.928	26.5
		0.0000	.5107	-.2950			GAP 7			GAP 7	119.289	21.4
		0.0000	.5107	-.2950	GAP 8			GAP 8			94.876	59.1
13	27	0.0000	.5471	-.3160	.7455	1.1313	1.4377	-30.8	-31.3	-32.2	79.701	56.3
13	28	0.0000	.6199	-.3579	1.4377	1.6442	1.7362	-32.6	-33.5	-34.2	34.698	48.4
14	29	0.0000	.7107	-.4103	1.7382	1.6483	1.2969	-34.3	-35.1	-35.9	34.571	-119.6
14	30	0.0000	.8195	-.4731	1.3169	.7379	.0000	-36.0	-36.6	-35.5	102.714	-126.0
		-.0000	0.0000	-.0000	GAP 9			GAP 9			19.722	60.2
15	31	.0208	0.0000	.0097	.0619	.0730	.0253	-67.5	-54.7	-52.3	7.959	-167.6
15	32	.0623	0.0000	.0291	.0066	.0825	.1888	-86.4	132.6	131.6	40.609	-139.6
15	33	.1038	0.0000	.0484	.1932	.3116	.4352	131.8	131.6	131.6	50.630	-138.5
16	34	.1671	0.0000	.0780	.4401	.6945	.9181	131.7	131.6	131.6	49.276	-138.6
17	35	.2529	0.0000	.1181	.9245	1.0938	1.1832	131.6	131.4	131.3	26.278	-139.6
17	36	.3394	0.0000	.1584	1.1874	1.1849	1.0863	131.3	131.1	131.0	10.286	44.4
18	37	.4236	0.0000	.1977	1.0905	.9124	.6625	131.0	130.8	130.7	45.825	41.4
18	38	.5055	0.0000	.2359	.6733	.3608	.0000	130.6	130.5	178.9	72.086	40.6
		.0000	0.0000	.0000	GAP 10			GAP 10			19.722	60.2
19	39	-.0208	0.0000	-.0097	.0619	.0730	.0253	-67.5	-54.7	-52.3	7.959	-167.6
19	40	-.0623	0.0000	-.0291	.0066	.0825	.1888	-86.4	132.6	131.6	40.609	-139.6
19	41	-.1038	0.0000	-.0484	.1932	.3116	.4352	131.8	131.6	131.6	50.630	-138.5
20	42	-.1671	0.0000	-.0780	.4401	.6945	.9181	131.7	131.6	131.6	49.276	-138.6
21	43	-.2529	0.0000	-.1181	.9245	1.0938	1.1832	131.6	131.4	131.3	26.278	-139.6
21	44	-.3394	0.0000	-.1584	1.1874	1.1849	1.0863	131.3	131.1	131.0	10.286	44.4
22	45	-.4236	0.0000	-.1977	1.0905	.9124	.6625	131.0	130.8	130.7	45.825	41.4
22	46	-.5055	0.0000	-.2359	.6733	.3608	.0000	130.6	130.5	178.9	72.086	40.6

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT DEGREES
1	605.862	-415.250	.001123	.000770	0.000	0.000	609.376	-424.544	1000.000 0.0
2	605.862	-415.250	.001123	.000770	0.000	0.000	609.376	-424.544	1000.000 0.0
3					INFINITE	INFINITE	-95.337	21.085	65.153 19.8
6					INFINITE	INFINITE	-95.337	21.085	65.153 19.8
9					INFINITE	INFINITE	.000	9645.754	596.589 22.5
10					INFINITE	INFINITE	.000	9645.754	596.589 22.5

	OHMS	OHMS	MHOS	MHOS	OHMS	OHMS	OHMS	OHMS	VOLT	DEGREES
4					INFINITE	INFINITE	-600.000	-.000	447.298	-30.8
7					INFINITE	INFINITE	-600.000	.000	447.298	-30.8

INPUT POWER = 2246.009 WATTS
RADIATED POWER = 705.943 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 1540.066 WATTS
RADIATION EFFICIENCY = 31.43 PER CENT

FREQUENCY = 2.8000 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 341

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 29.3 PER CENT FOR GAPS 9 AND 3

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000

WIRE NO	INT NO	COORDINATES X WAVELENGTHS	COORDINATES Y WAVELENGTHS	COORDINATES Z WAVELENGTHS	CURRENT DISTRIBUTION AMPLITUDE			CURRENT DISTRIBUTION PHASE			NORMAL ELECTRIC FIELD * RADIUS VOLTS	NORMAL ELECTRIC FIELD * RADIUS DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			188.017	-.2
1	1	0.0000	0.0000	.0292	4.6498	4.0432	3.3829	85.8	85.4	85.0	208.846	-1.9
1	2	0.0000	0.0000	.0875	3.4219	2.6905	1.8736	85.0	84.7	84.4	254.977	-4.2
1	3	0.0000	0.0000	.1458	1.9054	.9984	.0000	84.4	84.1	83.8	313.746	-5.6
		0.0000	0.0000	0.0000	GAP 2			GAP 2			188.017	179.8
2	4	0.0000	0.0000	-.0292	4.6498	4.0432	3.3829	-94.2	-94.6	-95.0	208.846	178.1
2	5	0.0000	0.0000	-.0875	3.4219	2.6905	1.8736	-95.0	-95.3	-95.6	254.977	175.8
2	6	0.0000	0.0000	-.1458	1.9054	.9984	.0000	-95.6	-95.9	-96.2	313.746	174.4
		0.0000	0.0000	0.0000	GAP 3			GAP 3			28.412	154.3
3	7	0.0000	.0252	.0146	.6116	.5687	.5309	-58.7	-52.6	-48.4	21.438	-164.6
3	8	0.0000	.0757	.0438	.5363	.4944	.4433	-49.3	-46.8	-45.4	16.272	-157.1
3	9	0.0000	.1261	.0730	.4448	.3837	.3130	-45.7	-45.3	-46.3	21.724	-134.2
4	10	0.0000	.2031	.1175	.3156	.1530	.0872	-47.0	-59.9	-160.1	29.358	-124.0
5	11	0.0000	.3076	.1777	.0912	.2498	.3989	-157.3	165.1	157.9	27.381	-123.0
5	12	0.0000	.4130	.2385	.4000	.4968	.5246	158.2	155.0	152.7	10.629	-134.1
6	13	0.0000	.5118	.2955	.5258	.4886	.3971	152.8	150.9	148.3	12.211	-76.3
6	14	0.0000	.6040	.3488	.3989	.2622	.1020	148.6	143.5	120.9	28.527	67.3
		0.0000	.6500	.3755			GAP 4			GAP 4	32.802	66.0
		0.0000	.6500	.3755	GAP 5			GAP 5			27.682	48.7
7	15	0.0000	.6963	.4022	.1020	.0703	.2226	120.9	-14.4	-32.6	28.880	49.1
7	16	0.0000	.7889	.4555	.2238	.3594	.4584	-32.3	-35.5	-36.9	21.494	48.7
8	17	0.0000	.9045	.5222	.4599	.5148	.4450	-36.9	-38.0	-38.8	1.305	-83.1
8	18	0.0000	1.0430	.6021	.4546	.2677	.0000	-38.9	-39.5	-39.9	28.319	-128.9
		0.0000	0.0000	0.0000	GAP 6			GAP 6			28.412	-25.7
9	19	0.0000	.0252	-.0146	.6116	.5687	.5309	121.3	127.4	131.6	21.438	-15.4
9	20	0.0000	.0757	-.0438	.5363	.4944	.4433	130.7	133.2	134.6	16.272	22.9
9	21	0.0000	.1261	-.0730	.4448	.3837	.3130	134.3	134.7	133.7	21.724	45.8
10	22	0.0000	.2031	-.1175	.3156	.1530	.0872	133.0	120.1	19.9	29.358	56.0
11	23	0.0000	.3076	-.1777	.0912	.2498	.3989	22.7	-14.9	-22.1	27.381	57.0
11	24	0.0000	.4130	-.2385	.4000	.4968	.5246	-21.8	-25.0	-27.3	10.629	45.9
12	25	0.0000	.5118	-.2955	.5258	.4886	.3971	-27.2	-29.1	-31.7	12.211	-103.7
12	26	0.0000	.6040	-.3488	.3989	.2622	.1020	-31.4	-36.5	-59.1	28.527	-112.7
		0.0000	.6500	-.3755			GAP 7			GAP 7	32.802	-114.0
		0.0000	.6500	-.3755	GAP 8			GAP 8			27.682	-131.3
13	27	0.0000	.6963	-.4022	.1020	.0703	.2226	-59.1	165.6	147.4	28.880	-130.9
13	28	0.0000	.7889	-.4555	.2238	.3594	.4584	147.7	144.5	143.1	21.494	-131.3
14	29	0.0000	.9045	-.5222	.4599	.5148	.4450	143.1	142.0	141.2	1.305	96.9
14	30	0.0000	1.0430	-.6021	.4546	.2677	.0000	141.1	140.5	140.1	28.319	51.1
		0.0000	0.0000	0.0000	GAP 9			GAP 9			15.514	-178.9
15	31	.0264	0.0000	.0123	.9491	.8965	.8334	-80.4	-80.1	-80.2	19.069	-171.7

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
15	32	.0792	0.0000	.0370	.8388	.7620	.6687	-80.2	-80.7	-81.6	28.192	-164.6
15	33	.1320	0.0000	.0616	.6707	.5624	.4414	-81.7	-83.4	-86.4	38.482	-162.8
16	34	.2126	0.0000	.0993	.4450	.1836	.1844	-86.4	-108.5	143.0	47.578	-162.5
17	35	.3219	0.0000	.1503	.1819	.4389	.6552	144.2	121.3	115.9	40.480	-164.0
17	36	.4320	0.0000	.2016	.6542	.7838	.8070	116.0	113.6	112.2	12.899	-173.4
18	37	.5392	0.0000	.2516	.8088	.7270	.5529	112.2	111.4	110.7	21.765	25.6
18	38	.6434	0.0000	.3003	.5621	.3089	.0000	110.7	110.2	108.9	47.686	20.7
		0.0000	0.0000	0.0000	GAP 10			GAP 10			15.514	1.1
19	39	-.0264	0.0000	-.0123	.9491	.8965	.8334	99.6	99.9	99.8	19.069	8.3
19	40	-.0792	0.0000	-.0370	.8388	.7620	.6687	99.8	99.3	98.4	28.192	15.4
19	41	-.1320	0.0000	-.0616	.6707	.5624	.4414	98.3	96.6	93.6	38.482	17.2
20	42	-.2126	0.0000	-.0993	.4450	.1836	.1844	93.6	71.5	-37.0	47.578	17.5
21	43	-.3219	0.0000	-.1503	.1819	.4389	.6552	-35.8	-58.7	-64.1	40.480	16.0
21	44	-.4320	0.0000	-.2016	.6542	.7838	.8070	-64.0	-66.4	-67.8	12.899	6.6
22	45	-.5392	0.0000	-.2516	.8088	.7270	.5529	-67.8	-68.6	-69.3	21.765	-154.4
22	46	-.6434	0.0000	-.3003	.5621	.3089	.0000	-69.3	-69.8	-71.1	47.686	-159.3

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IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	15.665	-214.492	.000339	.004637	0.000	0.000	15.665	-214.492	1000.000	0.0
2	15.665	-214.492	.000339	.004637	0.000	0.000	15.665	-214.492	1000.000	-180.0
3					INFINITE	INFINITE	-92.658	26.082	58.874	105.6
6					INFINITE	INFINITE	-92.658	26.082	58.874	-74.4
9					INFINITE	INFINITE	-.000	.000	.000	-21.2
0					INFINITE	INFINITE	-.000	-.000	.000	-21.2
4					INFINITE	INFINITE	-600.000	-.000	61.189	120.9
7					INFINITE	INFINITE	-600.000	-.000	61.189	-59.1

INPUT POWER = 677.354 WATTS
RADIATED POWER = 513.746 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 163.608 WATTS
RADIATION EFFICIENCY = 75.85 PER CENT

EXCITATION MODE

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

WIRE NO	INT NO	COORDINATES X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	CURRENT DISTRIBUTION AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	NORMAL ELECTRIC FIELD & RADIUS VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			158.839	-16.0
1	1	0.0000	0.0000	.0292	4.0830	3.5634	2.9855	71.1	70.8	70.6	180.804	-17.5
1	2	0.0000	0.0000	.0875	3.0140	2.3683	1.6478	70.6	70.5	70.4	224.975	-19.1
1	3	0.0000	0.0000	.1458	1.6750	.8767	.0000	70.4	70.3	70.3	275.811	-19.6
		0.0000	0.0000	0.0000	GAP 2			GAP 2			158.839	-16.0
2	4	0.0000	0.0000	-.0292	4.0830	3.5634	2.9855	71.1	70.8	70.6	180.804	-17.5
2	5	0.0000	0.0000	-.0875	3.0140	2.3683	1.6478	70.6	70.5	70.4	224.975	-19.1
2	6	0.0000	0.0000	-.1458	1.6750	.8767	.0000	70.4	70.3	70.3	275.811	-19.6
		0.0000	0.0000	0.0000	GAP 3			GAP 3			42.797	-170.2
3	7	0.0000	.0252	.0146	2.0406	1.9230	1.8004	-109.7	-111.5	-113.5	44.819	-173.5
3	8	0.0000	.0757	.0438	1.8192	1.6766	1.5004	-113.4	-115.5	-118.0	56.990	177.3
3	9	0.0000	.1261	.0730	1.5051	1.2975	1.0630	-118.0	-121.2	-125.8	78.210	169.8
4	10	0.0000	.2031	.1175	1.0692	.5609	.3997	-125.7	-147.4	132.7	99.311	163.1
5	11	0.0000	.3076	.1777	.3953	.8457	1.2967	133.8	93.0	82.1	88.209	155.6
5	12	0.0000	.4130	.2385	1.2938	1.5835	1.6596	82.1	76.7	72.8	35.086	134.2
6	13	0.0000	.5118	.2955	1.6600	1.5384	1.2546	72.9	69.6	65.5	40.747	4.1
6	14	0.0000	.6040	.3488	1.2585	.8445	.3847	65.8	58.3	31.6	88.183	-11.2
		0.0000	.6500	.3755			GAP 4			GAP 4	100.208	-13.8
		0.0000	.6500	.3755	GAP 5			GAP 5			78.544	-34.0
7	15	0.0000	.6963	.4022	.3847	.1885	.5715	31.6	-67.2	-108.5	82.040	-34.4
7	16	0.0000	.7889	.4555	.5747	.9531	1.2334	-108.2	-115.2	-118.2	61.466	-36.7
8	17	0.0000	.9045	.5222	1.2354	1.3968	1.2124	-118.3	-120.6	-122.1	5.306	-135.8
8	18	0.0000	1.0430	.6021	1.2336	.7265	.0000	-122.3	-123.4	-124.2	76.838	147.7
		0.0000	0.0000	0.0000	GAP 6			GAP 6			42.797	-170.2
9	19	0.0000	.0252	-.0146	2.0406	1.9230	1.8004	-109.7	-111.5	-113.5	44.819	-173.5
9	20	0.0000	.0757	-.0438	1.8192	1.6766	1.5004	-113.4	-115.5	-118.0	56.990	177.3
9	21	0.0000	.1261	-.0730	1.5051	1.2975	1.0630	-118.0	-121.2	-125.8	78.210	169.8
10	22	0.0000	.2031	-.1175	1.0692	.5609	.3997	-125.7	-147.4	132.7	99.311	163.1
11	23	0.0000	.3076	-.1777	.3953	.8457	1.2967	133.8	93.0	82.1	88.209	155.6
11	24	0.0000	.4130	-.2385	1.2938	1.5835	1.6596	82.1	76.7	72.8	35.086	134.2

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
12	25	0.0000	.5118	-.2955	1.6600	1.5384	1.2546	72.9	69.6	65.5	40.747	4.1
12	26	0.0000	.6040	-.3488	1.2585	.8445	.3847	65.8	58.3	31.6	88.183	-11.2
		0.0000	.6500	-.3755			GAP 7			GAP 7	100.208	-13.8
		0.0000	.6500	-.3755	GAP 8			GAP 8			78.544	-34.0
13	27	0.0000	.6963	-.4022	.3847	.1885	.5715	31.6	-67.2	-108.5	82.040	-34.4
13	28	0.0000	.7889	-.4555	.5747	.9531	1.2334	-108.2	-115.2	-118.2	61.466	-36.7
14	29	0.0000	.9045	-.5222	1.2354	1.3968	1.2124	-118.3	-120.6	-122.1	5.306	-135.8
14	30	0.0000	1.0430	-.6021	1.2386	.7265	.0000	-122.3	-123.4	-124.2	76.838	147.7
		0.0000	0.0000	0.0000	GAP 9			GAP 9			50.764	132.9
15	31	.0264	0.0000	.0123	.0529	.1582	.2256	-21.2	23.9	26.8	31.994	128.5
15	32	.0792	0.0000	.0370	.2067	.2365	.2471	24.4	22.9	20.0	7.236	88.8
15	33	.1320	0.0000	.0616	.2432	.2393	.2258	19.4	15.1	9.6	7.210	-8.8
16	34	.2126	0.0000	.0993	.2219	.1785	.1459	8.8	-9.7	-39.9	13.629	-40.1
17	35	.3219	0.0000	.1503	.1442	.1529	.1861	-41.2	-76.8	-100.4	13.472	-58.2
17	36	.4320	0.0000	.2016	.1848	.2112	.2144	-100.6	-114.3	-122.9	6.636	-91.1
18	37	.5392	0.0000	.2516	.2128	.1899	.1436	-122.9	-128.7	-133.2	6.457	167.0
18	38	.6434	0.0000	.3003	.1440	.0782	.0000	-133.0	-136.7	-147.0	12.213	137.0
		0.0000	0.0000	0.0000	GAP 10			GAP 10			50.764	132.9
19	39	-.0264	0.0000	-.0123	.0529	.1582	.2256	-21.2	23.9	26.8	31.994	128.5
19	40	-.0792	0.0000	-.0370	.2067	.2365	.2471	24.4	22.9	20.0	7.236	88.8
19	41	-.1320	0.0000	-.0616	.2432	.2393	.2258	19.4	15.1	9.6	7.210	-8.8
20	42	-.2126	0.0000	-.0993	.2219	.1785	.1459	8.8	-9.7	-39.9	13.629	-40.1
21	43	-.3219	0.0000	-.1503	.1442	.1529	.1861	-41.2	-76.8	-100.4	13.472	-58.2
21	44	-.4320	0.0000	-.2016	.1848	.2112	.2144	-100.6	-114.3	-122.9	6.636	-91.1
22	45	-.5392	0.0000	-.2516	.2128	.1899	.1436	-122.9	-128.7	-133.2	6.457	167.0
22	46	-.6434	0.0000	-.3003	.1440	.0782	.0000	-133.0	-136.7	-147.0	12.213	137.0

IMPEDANCE DATA

INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
79.398	-231.691	.001324	.003862	0.000	0.000	79.398	-231.691	1000.000	0.0
79.398	-231.691	.001324	.003862	0.000	0.000	79.398	-231.691	1000.000	0.0
				INFINITE	INFINITE	-92.658	26.082	196.428	54.6
				INFINITE	INFINITE	-92.658	26.082	196.428	54.6
				INFINITE	INFINITE	.000	7578.807	401.298	68.8
				INFINITE	INFINITE	.000	7578.807	401.298	68.8
				INFINITE	INFINITE	-600.000	.000	230.825	31.6
				INFINITE	INFINITE	-600.000	-.000	230.825	31.6

INPUT POWER = 2647.291 WATTS
RADIATED POWER = 748.729 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 1898.562 WATTS
RADIATION EFFICIENCY = 28.28 PER CENT

WIRE COORDINATES IN FEET AND WIRE RADII IN INCHES

WIRE NO		X1	Y1	Z1	RAD1		X2	Y2	Z2	RAD2	INTERVALS
1	GAP 1	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	61.5000	.250000	3
2	GAP 2	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	-61.5000	.250000	3
3	GAP 3	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	30.8000	.250000	3
4		-0.0000	53.2000	30.8000	.250000		-0.0000	89.6000	51.8000	.250000	2
5		-0.0000	89.6000	51.8000	.250000		-0.0000	163.7000	94.5000	.250000	3
6		-0.0000	163.7000	94.5000	.250000	GAP 4	-0.0000	228.5000	132.0000	.250000	2
7	GAP 5	-0.0000	228.5000	132.0000	.250000		-0.0000	293.6000	169.5000	.250000	2
8		-0.0000	293.6000	169.5000	.250000		-0.0000	391.0000	225.7000	.250000	3
9	GAP 6	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	-30.8000	.250000	3
10		-0.0000	53.2000	-30.8000	.250000		-0.0000	89.6000	-51.8000	.250000	2
11		-0.0000	89.6000	-51.8000	.250000		-0.0000	163.7000	-94.5000	.250000	3
12		-0.0000	163.7000	-94.5000	.250000	GAP 7	-0.0000	228.5000	-132.0000	.250000	2
13	GAP 8	-0.0000	228.5000	-132.0000	.250000		-0.0000	293.6000	-169.5000	.250000	2
14		-0.0000	293.6000	-169.5000	.250000		-0.0000	391.0000	-225.7000	.250000	3
15	GAP 9	-0.0000	-0.0000	-0.0000	.290000		55.7000	-0.0000	26.0000	.290000	3
16		55.7000	-0.0000	26.0000	.290000		93.8000	-0.0000	43.8000	.290000	2
17		93.8000	-0.0000	43.8000	.290000		171.2000	-0.0000	79.9000	.290000	3
18		171.2000	-0.0000	79.9000	.290000		244.5000	-0.0000	114.1000	.290000	2
19	GAP 10	-0.0000	-0.0000	-0.0000	.290000		-55.7000	-0.0000	-26.0000	.290000	3
20		-55.7000	-0.0000	-26.0000	.290000		-93.8000	-0.0000	-43.8000	.290000	2
21		-93.8000	-0.0000	-43.8000	.290000		-171.2000	-0.0000	-79.9000	.290000	3
22		-171.2000	-0.0000	-79.9000	.290000		-244.5000	-0.0000	-114.1000	.290000	2

FREQUENCY = 3.9300 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 344

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 33.2 PER CENT FOR GAPS 3 AND 1

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000

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		COORDINATES			CURRENT DISTRIBUTION						NORMAL ELECTRIC FIELD * RADIUS	
		X	Y	Z	AMPLITUDE			PHASE				
IRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			199.719	-1.2
1	1	0.0000	0.0000	.0409	32.7082	31.7369	28.7081	-6.9	-8.2	-9.1	491.589	-81.7
1	2	0.0000	0.0000	.1228	28.7656	23.8100	17.1921	-9.0	-9.6	-10.2	1366.389	-97.1
1	3	0.0000	0.0000	.2046	17.4580	9.3442	.0000	-10.2	-10.7	-13.4	2059.312	-100.2
		0.0000	0.0000	0.0000	GAP 2			GAP 2			199.719	178.8
2	4	0.0000	0.0000	-.0409	32.7082	31.7369	28.7081	173.1	171.8	170.9	491.589	98.3
2	5	0.0000	0.0000	-.1228	28.7656	23.8100	17.1921	171.0	170.4	169.8	1366.389	82.9
2	6	0.0000	0.0000	-.2046	17.4580	9.3442	.0000	169.8	169.3	166.6	2059.312	79.8
		0.0000	0.0000	0.0000	GAP 3			GAP 3			26.736	11.9
3	7	0.0000	.0354	.0205	1.9310	1.9250	1.9600	177.6	179.4	178.3	4.327	-54.5
3	8	0.0000	.1062	.0615	1.9907	2.0393	2.0808	178.0	174.4	169.0	38.894	-170.7
3	9	0.0000	.1770	.1025	2.1022	2.1292	2.1346	169.0	162.3	154.5	63.040	165.2
4	10	0.0000	.2488	.1439	2.1545	2.1334	2.0822	154.5	145.6	135.6	80.501	139.2
4	11	0.0000	.3214	.1859	2.0971	2.0203	1.9281	135.7	124.6	112.0	97.048	112.5
5	12	0.0000	.4071	.2352	1.9425	1.8256	1.7634	112.2	92.7	70.7	113.487	84.2
5	13	0.0000	.5057	.2921	1.7736	1.7947	1.8899	71.0	48.3	26.9	118.242	53.5
5	14	0.0000	.6043	.3489	1.8940	2.0097	2.0927	27.2	8.2	-8.9	107.069	17.8
6	15	0.0000	.7183	.4148	2.1007	2.0916	1.9377	-8.8	-29.9	-52.4	100.046	-36.4

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
6	16	0.0000	.8477	.4896	1.9804	1.7250	1.5991	-51.8	-79.5	-116.6	128.893	-93.7
		0.0000	.9124	.5271			GAP 4			GAP 4	142.566	-114.1
		0.0000	.9124	.5271	GAP 5			GAP 5			17.045	36.2
7	17	0.0000	.9774	.5645	1.5991	1.4777	1.0158	-116.6	-113.8	-114.0	38.740	148.9
7	18	0.0000	1.1073	.6394	1.0153	.3248	.4936	-116.1	-129.7	81.7	98.659	159.7
8	19	0.0000	1.2371	.7142	.4967	1.1875	1.6418	82.1	74.0	71.8	76.582	157.4
8	20	0.0000	1.3668	.7890	1.6509	1.7559	1.4786	71.7	70.5	69.7	11.992	-1.3
8	21	0.0000	1.4964	.8638	1.5098	.8790	.0000	69.4	68.7	-115.6	99.971	-20.6
		0.0000	0.0000	0.0000	GAP 6			GAP 6			26.736	-168.1
9	22	0.0000	.0354	-.0205	1.9310	1.9250	1.9600	-2.4	-.6	-1.7	4.327	125.5
9	23	0.0000	.1062	-.0615	1.9907	2.0393	2.0808	-2.0	-5.6	-11.0	38.894	9.3
9	24	0.0000	.1770	-.1025	2.1022	2.1292	2.1346	-11.0	-17.7	-25.5	63.040	-14.8
10	25	0.0000	.2488	-.1439	2.1545	2.1334	2.0822	-25.5	-34.4	-44.4	80.501	-40.8
10	26	0.0000	.3214	-.1859	2.0971	2.0203	1.9281	-44.3	-55.4	-68.0	97.048	-67.5
11	27	0.0000	.4071	-.2352	1.9425	1.8256	1.7634	-67.8	-87.3	-109.3	113.487	-95.8
11	28	0.0000	.5057	-.2921	1.7736	1.7947	1.8899	-109.0	-131.7	-153.1	118.242	-126.5
11	29	0.0000	.6043	-.3489	1.8940	2.0097	2.0927	-152.8	-171.8	171.1	107.069	-162.2
12	30	0.0000	.7183	-.4148	2.1007	2.0916	1.9377	171.2	150.1	127.6	100.046	143.6
12	31	0.0000	.8477	-.4896	1.9804	1.7250	1.5991	128.2	100.5	63.4	128.893	86.3
		0.0000	.9124	-.5271			GAP 7			GAP 7	142.566	65.9
		0.0000	.9124	-.5271	GAP 8			GAP 8			17.045	-143.8
13	32	0.0000	.9774	-.5645	1.5991	1.4777	1.0158	63.4	66.2	66.0	38.740	-31.1
13	33	0.0000	1.1073	-.6394	1.0153	.3248	.4936	63.9	50.3	-98.3	98.659	-20.3
14	34	0.0000	1.2371	-.7142	.4967	1.1875	1.6418	-97.9	-106.0	-108.2	76.582	-22.6
14	35	0.0000	1.3668	-.7890	1.6509	1.7559	1.4786	-108.3	-109.5	-110.3	11.992	178.7
14	36	0.0000	1.4964	-.8638	1.5098	.8790	.0000	-110.6	-111.3	64.4	99.971	159.4
		0.0000	0.0000	0.0000	GAP 9			GAP 9			18.614	117.2
15	37	.0371	0.0000	.0173	1.3828	1.3815	1.4121	130.8	129.0	130.3	3.756	-162.8
15	38	.1112	0.0000	.0519	1.4226	1.4769	1.5445	131.1	134.2	137.9	25.244	-80.2
15	39	.1853	0.0000	.0865	1.5588	1.6243	1.6674	138.2	141.9	145.1	26.043	-67.8
16	40	.2604	0.0000	.1216	1.6829	1.6835	1.6207	145.2	147.8	149.7	16.425	-6.7
16	41	.3365	0.0000	.1571	1.6333	1.4966	1.2817	149.7	150.8	151.0	40.642	54.9
17	42	.4260	0.0000	.1989	1.2947	.8930	.4033	150.9	148.8	135.7	78.258	67.6
17	43	.5291	0.0000	.2470	.4157	.2580	.7605	135.3	24.9	-4.9	95.448	71.2
17	44	.6321	0.0000	.2950	.7596	1.2273	1.5669	4.4	-9.7	-11.8	70.327	-71.4
18	45	.7568	0.0000	.3532	1.5738	1.7427	1.4992	-11.5	-12.9	-13.7	5.839	-64.7
18	46	.9031	0.0000	.4214	1.5379	.9038	.0000	-13.7	-14.2	-161.7	94.963	-103.7
		0.0000	0.0000	0.0000	GAP 10			GAP 10			18.614	-62.8
19	47	-.0371	0.0000	-.0173	1.3828	1.3815	1.4121	-49.2	-51.0	-49.7	3.756	17.2
19	48	-.1112	0.0000	-.0519	1.4226	1.4769	1.5445	-48.9	-45.8	-42.1	25.244	99.8
19	49	-.1853	0.0000	-.0865	1.5588	1.6243	1.6674	-41.8	-38.1	-34.9	26.043	112.2
20	50	-.2604	0.0000	-.1216	1.6829	1.6835	1.6207	-34.8	-32.2	-30.3	16.425	173.3
20	51	-.3365	0.0000	-.1571	1.6333	1.4966	1.2817	-30.3	-29.2	-29.0	40.642	-125.1
21	52	-.4260	0.0000	-.1989	1.2947	.8930	.4033	-29.1	-31.2	-44.3	78.258	-112.4
21	53	-.5291	0.0000	-.2470	.4157	.2580	.7605	-44.7	-155.1	175.1	95.448	-108.8
21	54	-.6321	0.0000	-.2950	.7596	1.2273	1.5669	175.6	170.3	168.2	70.327	-108.6
22	55	-.7568	0.0000	-.3532	1.5738	1.7427	1.4992	168.5	167.1	166.3	5.839	115.3
22	56	-.9031	0.0000	-.4214	1.5379	.9038	.0000	166.3	165.8	18.3	94.963	76.3

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	30.352	3.673	.032471	-.003929	0.000	0.000	30.352	3.673	1000.000	0.0
2	30.352	3.673	.032471	-.003929	0.000	0.000	30.352	3.673	1000.000	-180.0
3					INFINITE	INFINITE	-86.498	34.174	179.589	-24.0
6					INFINITE	INFINITE	-86.498	34.174	179.589	156.0
9					INFINITE	INFINITE	-.000	.000	.000	-92.1
10					INFINITE	INFINITE	.000	-.000	.000	-92.1
4					INFINITE	INFINITE	-600.000	-.000	959.485	-116.6
7					INFINITE	INFINITE	-600.000	.000	959.485	63.4

INPUT POWER = 64942.670 WATTS
RADIATED POWER = 57515.182 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 7427.487 WATTS
RADIATION EFFICIENCY = 88.56 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED.

COORDINATES CURRENT DISTRIBUTION NORMAL ELECTRIC FIELD * RADIUS

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			95.362	-2.2
1	1	0.0000	0.0000	.0409	3.6942	3.5434	3.1876	5.6	.5	-2.6	83.504	-44.0
1	2	0.0000	0.0000	.1228	3.1898	2.6272	1.8896	-1.6	-3.2	-4.5	154.107	-87.3
1	3	0.0000	0.0000	.2046	1.9184	1.0233	.0000	-4.3	-5.2	-10.3	226.291	-94.3
		0.0000	0.0000	0.0000	GAP 2			GAP 2			95.362	-2.2
2	4	0.0000	0.0000	-.0409	3.6942	3.5434	3.1876	5.6	.5	-2.6	83.504	-44.0
2	5	0.0000	0.0000	-.1228	3.1898	2.6272	1.8896	-1.6	-3.2	-4.5	154.107	-87.3
2	6	0.0000	0.0000	-.2046	1.9184	1.0233	.0000	-4.3	-5.2	-10.3	226.291	-94.3
		0.0000	0.0000	0.0000	GAP 3			GAP 3			85.663	-174.4
3	7	0.0000	.0354	.0205	1.8413	1.8486	1.8658	-175.8	172.2	159.4	93.995	173.5
3	8	0.0000	.1062	.0615	1.8783	1.9071	1.9364	159.3	146.3	133.4	100.857	150.1
3	9	0.0000	.1770	.1025	1.9413	1.9633	1.9689	133.4	120.9	108.6	99.295	122.9
4	10	0.0000	.2488	.1439	1.9717	1.9539	1.9106	108.7	96.1	83.3	98.266	92.0
4	11	0.0000	.3214	.1859	1.9120	1.8465	1.7690	83.4	70.1	55.8	102.286	60.6
5	12	0.0000	.4071	.2352	1.7694	1.6698	1.6135	56.0	34.9	12.1	109.032	27.5
5	13	0.0000	.5057	.2921	1.6112	1.6186	1.6794	12.2	-11.0	-32.9	108.277	-7.5
5	14	0.0000	.6043	.3489	1.6762	1.7506	1.7966	-32.8	-52.6	-70.7	97.053	-46.0
6	15	0.0000	.7183	.4148	1.7961	1.7655	1.6276	-70.8	-93.4	-117.6	90.796	-100.7
6	16	0.0000	.8477	.4896	1.6596	1.4560	1.3664	-117.3	-146.4	175.8	111.786	-159.1
		0.0000	.9124	.5271			GAP 4			GAP 4	122.841	178.9
		0.0000	.9124	.5271	GAP 5			GAP 5			16.541	-46.8
7	17	0.0000	.9774	.5645	1.3664	1.2871	.8931	175.8	178.4	178.4	31.455	80.9
7	18	0.0000	1.1073	.6394	.8856	.2764	.4363	176.3	164.9	9.9	86.814	90.8
8	19	0.0000	1.2371	.7142	.4411	1.0552	1.4571	10.0	3.6	1.7	67.708	88.2
8	20	0.0000	1.3668	.7890	1.4652	1.5570	1.3099	1.6	.5	-.3	10.697	-73.3
8	21	0.0000	1.4964	.8638	1.3366	.7773	.0000	-.5	-1.2	174.8	88.508	-90.5
		0.0000	0.0000	0.0000	GAP 6			GAP 6			85.663	-174.4
9	22	0.0000	.0354	-.0205	1.8413	1.8486	1.8658	-175.8	172.2	159.4	93.995	173.5
9	23	0.0000	.1062	-.0615	1.8783	1.9071	1.9364	159.3	146.3	133.4	100.857	150.1
9	24	0.0000	.1770	-.1025	1.9413	1.9633	1.9689	133.4	120.9	108.6	99.295	122.9
10	25	0.0000	.2488	-.1439	1.9717	1.9539	1.9106	108.7	96.1	83.3	98.266	92.0
10	26	0.0000	.3214	-.1859	1.9120	1.8465	1.7690	83.4	70.1	55.8	102.286	60.6
11	27	0.0000	.4071	-.2352	1.7694	1.6698	1.6135	56.0	34.9	12.1	109.032	27.5
11	28	0.0000	.5057	-.2921	1.6112	1.6186	1.6794	12.2	-11.0	-32.9	108.277	-7.5
11	29	0.0000	.6043	-.3489	1.6762	1.7506	1.7966	-32.8	-52.6	-70.7	97.053	-46.0
12	30	0.0000	.7183	-.4148	1.7961	1.7655	1.6276	-70.8	-93.4	-117.6	90.796	-100.7
12	31	0.0000	.8477	-.4896	1.6596	1.4560	1.3664	-117.3	-146.4	175.8	111.786	-159.1
		0.0000	.9124	-.5271			GAP 7			GAP 7	122.841	178.9
		0.0000	.9124	-.5271	GAP 8			GAP 8			16.541	-46.8
13	32	0.0000	.9774	-.5645	1.3664	1.2871	.8931	175.8	178.4	178.4	31.455	80.9
13	33	0.0000	1.1073	-.6394	.8856	.2764	.4363	176.3	164.9	9.9	86.814	90.8
14	34	0.0000	1.2371	-.7142	.4411	1.0552	1.4571	10.0	3.6	1.7	67.708	88.2
14	35	0.0000	1.3668	-.7890	1.4652	1.5570	1.3099	1.6	.5	-.3	10.697	-73.3
14	36	0.0000	1.4964	-.8638	1.3366	.7773	.0000	-.5	-1.2	174.8	88.508	-90.5
		0.0000	0.0000	0.0000	GAP 9			GAP 9			14.035	-162.4
15	37	.0371	0.0000	.0173	.0956	.0349	.2179	-92.0	166.3	113.8	36.208	-164.0
15	38	.1112	0.0000	.0519	.2493	.4926	.7347	112.9	109.1	107.6	57.469	-165.1

WIRE NO	INT NO	X WAVELENGTHS	Y WAVELENGTHS	Z WAVELENGTHS	AMPLITUDE AMP.	AMP.	AMP	PHASE DEG.	DEG.	DEG	VOLTS	DEG
15	39	.1853	0.0000	.0865	.7424	.9591	1.1285	107.6	106.7	106.0	45.681	-167.3
16	40	.2604	0.0000	.1216	1.1326	1.2415	1.2732	106.0	105.2	104.4	16.598	-177.7
16	41	.3365	0.0000	.1571	1.2758	1.2254	1.0942	104.4	103.5	102.2	21.562	27.7
17	42	.4260	0.0000	.1989	1.0968	.8056	.4190	102.2	99.2	90.6	59.351	19.2
17	43	.5291	0.0000	.2470	.4212	.1270	.5066	90.6	-4.1	-60.6	77.151	16.4
17	44	.6321	0.0000	.2950	.5059	.8909	1.1745	-60.6	-67.2	-69.7	58.325	13.6
18	45	.7568	0.0000	.3532	1.1770	1.3306	1.1556	-69.8	-71.6	-72.8	4.056	-90.3
18	46	.9031	0.0000	.4214	1.1794	.6954	.0000	-72.9	-73.8	99.8	72.828	-162.9
		0.0000	0.0000	0.0000	GAP 10			GAP 10			14.035	-162.4
19	47	-.0371	0.0000	-.0173	.0956	.0349	.2179	-92.0	166.3	113.8	36.208	-164.0
19	48	-.1112	0.0000	-.0519	.2493	.4926	.7347	112.9	109.1	107.6	57.469	-165.1
19	49	-.1853	0.0000	-.0865	.7424	.9591	1.1285	107.6	106.7	106.0	45.681	-167.3
20	50	-.2604	0.0000	-.1216	1.1326	1.2415	1.2732	106.0	105.2	104.4	16.598	-177.7
20	51	-.3365	0.0000	-.1571	1.2758	1.2254	1.0942	104.4	103.5	102.2	21.562	27.7
21	52	-.4260	0.0000	-.1989	1.0968	.8056	.4190	102.2	99.2	90.6	59.351	19.2
21	53	-.5291	0.0000	-.2470	.4212	.1270	.5066	90.6	-4.1	-60.6	77.151	16.4
21	54	-.6321	0.0000	-.2950	.5059	.8909	1.1745	-60.6	-67.2	-69.7	58.325	13.6
22	55	-.7568	0.0000	-.3532	1.1770	1.3306	1.1556	-69.8	-71.6	-72.8	4.056	-90.3
22	56	-.9031	0.0000	-.4214	1.1794	.6954	.0000	-72.9	-73.8	99.8	72.828	-162.9

A-165

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	269.381	-26.649	.003676	.000364	0.000	0.000	269.381	-26.649	1000.000	0.0
2	269.381	-26.649	.003676	.000364	0.000	0.000	269.381	-26.649	1000.000	0.0
3					INFINITE	INFINITE	-86.498	34.174	171.251	-17.4
6					INFINITE	INFINITE	-86.498	34.174	171.251	-17.4
9					INFINITE	INFINITE	-.000	5399.659	516.134	-2.0
10					INFINITE	INFINITE	-.000	5399.659	516.134	-2.0
4					INFINITE	INFINITE	-600.000	-.000	819.815	175.8
7					INFINITE	INFINITE	-600.000	-.000	819.815	175.8

INPUT POWER = 7352.466 WATTS
RADIATED POWER = 1698.742 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 5653.724 WATTS
RADIATION EFFICIENCY = 23.10 PER CENT

WIRE COORDINATES IN FEET AND WIRE RADII IN INCHES

WIRE NO		X1	Y1	Z1	RAD1		X2	Y2	Z2	RAD2	INTERVALS
1	GAP 1	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	61.5000	.250000	3
2	GAP 2	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	-61.5000	.250000	3
3	GAP 3	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	30.8000	.250000	3
4		-0.0000	53.2000	30.8000	.250000		-0.0000	89.6000	51.8000	.250000	2
5		-0.0000	89.6000	51.8000	.250000		-0.0000	163.7000	94.5000	.250000	3
6		-0.0000	163.7000	94.5000	.250000	GAP 4	-0.0000	228.5000	132.0000	.250000	3
7	GAP 5	-0.0000	228.5000	132.0000	.250000		-0.0000	293.6000	169.5000	.250000	3
8		-0.0000	293.6000	169.5000	.250000		-0.0000	391.0000	225.7000	.250000	4
9	GAP 6	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	-30.8000	.250000	3
10		-0.0000	53.2000	-30.8000	.250000		-0.0000	89.6000	-51.8000	.250000	2
11		-0.0000	89.6000	-51.8000	.250000		-0.0000	163.7000	-94.5000	.250000	3
12		-0.0000	163.7000	-94.5000	.250000	GAP 7	-0.0000	228.5000	-132.0000	.250000	3
13	GAP 8	-0.0000	228.5000	-132.0000	.250000		-0.0000	293.6000	-169.5000	.250000	3
14		-0.0000	293.6000	-169.5000	.250000		-0.0000	391.0000	-225.7000	.250000	4
15	GAP 9	-0.0000	-0.0000	-0.0000	.290000		55.7000	-0.0000	26.0000	.290000	3
16		55.7000	-0.0000	26.0000	.290000		93.8000	-0.0000	43.8000	.290000	2
17		93.8000	-0.0000	43.8000	.290000		171.2000	-0.0000	79.9000	.290000	3
18		171.2000	-0.0000	79.9000	.290000		244.5000	-0.0000	114.1000	.290000	3
19	GAP 10	-0.0000	-0.0000	-0.0000	.290000		-55.7000	-0.0000	-26.0000	.290000	3
20		-55.7000	-0.0000	-26.0000	.290000		-93.8000	-0.0000	-43.8000	.290000	2
21		-93.8000	-0.0000	-43.8000	.290000		-171.2000	-0.0000	-79.9000	.290000	3
22		-171.2000	-0.0000	-79.9000	.290000		-244.5000	-0.0000	-114.1000	.290000	3

FREQUENCY = 4.7000 MC

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 347

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 19.4 PER CENT FOR GAPS 3 AND 1

EXCITATION MODE

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9-10	-0.0000	-0.0000	-0.0000	-0.0000

		COORDINATES			CURRENT DISTRIBUTION						NORMAL ELECTRIC FIELD * RADIUS	
		X	Y	Z	AMPLITUDE			PHASE				
WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1			187.300	-2.4
1	1	0.0000	0.0000	.0489	6.0874	6.6053	6.4084	-65.6	-68.8	-70.7	62.804	-37.7
1	2	0.0000	0.0000	.1468	6.3683	5.5032	4.0877	-70.4	-71.7	-72.7	226.898	-156.4
1	3	0.0000	0.0000	.2447	4.1457	2.2526	.0000	-72.7	-73.5	98.0	410.856	-162.7
		0.0000	0.0000	.0000	GAP 2			GAP 2			187.300	177.6
2	4	0.0000	0.0000	-.0489	6.0874	6.6053	6.4084	114.4	111.2	109.3	62.804	142.3
2	5	0.0000	0.0000	-.1468	6.3683	5.5032	4.0877	109.6	108.3	107.3	226.898	23.6
2	6	0.0000	0.0000	-.2447	4.1457	2.2526	.0000	107.3	106.5	-82.0	410.856	17.3
		0.0000	-.0000	-.0000	GAP 3			GAP 3			8.697	175.2
3	7	0.0000	.0423	.0245	.3710	.3114	.2100	-138.5	-145.3	-161.7	19.430	156.3
3	8	0.0000	.1270	.0735	.2116	.1374	.2394	-161.9	-145.7	90.3	36.173	146.8
3	9	0.0000	.2117	.1226	.2444	.4234	.5999	90.4	72.8	64.8	39.056	139.2
4	10	0.0000	.2975	.1721	.6050	.7513	.8416	65.0	59.6	55.2	25.742	122.4
4	11	0.0000	.3844	.2223	.8459	.8673	.8155	55.2	50.8	45.4	14.025	38.3
5	12	0.0000	.4868	.2813	.8205	.6466	.4105	45.4	34.6	10.2	39.058	-18.5
5	13	0.0000	.6048	.3493	.4160	.3265	.5357	10.3	-48.9	-91.8	53.810	-35.0
5	14	0.0000	.7227	.4173	.5368	.7812	.9331	-91.5	-108.2	-117.8	36.972	-55.6
6	15	0.0000	.8333	.4811	.9345	.9542	.8648	-117.7	-124.7	-132.3	19.492	-141.9
6	16	0.0000	.9364	.5408	.8672	.6821	.4486	-132.3	-142.9	-163.5	44.011	163.4
6	17	0.0000	1.0396	.6005	.4588	.3103	.4496	-163.7	146.4	92.9	58.479	144.2
		0.0000	1.0911	.6303			GAP 4			GAP 4	57.056	135.0
		0.0000	1.0911	.6303	GAP 5			GAP 5			38.674	-169.6
7	18	0.0000	1.1429	.6602	.4496	.6528	.7643	92.9	94.7	94.3	25.762	-173.7
7	19	0.0000	1.2466	.7199	.7646	.7688	.6652	93.6	92.4	90.7	8.660	22.5
7	20	0.0000	1.3502	.7796	.6660	.4690	.2092	90.6	87.4	76.4	38.112	7.0
8	21	0.0000	1.4601	.8429	.2098	.1494	.4535	76.5	-59.8	-78.4	47.602	3.8

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
8	22	0.0000	1.5764	.9100	.4536	.6924	.8157	-78.5	-82.1	-83.8	26.859	-.4
8	23	0.0000	1.6927	.9771	.8184	.8010	.6428	-83.9	-85.0	-85.8	12.988	-166.9
8	24	0.0000	1.8090	1.0442	.6550	.3715	.0000	-85.9	-86.5	81.3	48.000	-175.9
		0.0000	-.0000	.0000	GAP 6			GAP 6			8.697	-4.8
9	25	0.0000	.0423	-.0245	.3710	.3114	.2100	41.5	34.7	18.3	19.430	-23.7
9	26	0.0000	.1270	-.0735	.2116	.1374	.2394	18.1	-34.3	-89.7	36.173	-33.2
9	27	0.0000	.2117	-.1226	.2444	.4234	.5999	-89.6	-107.2	-115.2	39.056	-40.8
10	28	0.0000	.2975	-.1721	.6050	.7513	.8416	-115.0	-120.4	-124.8	25.742	-57.6
10	29	0.0000	.3844	-.2223	.8459	.8673	.8155	-124.8	-129.2	-134.6	14.025	-141.7
11	30	0.0000	.4868	-.2813	.8205	.6464	.4105	-134.6	-145.4	-169.8	39.058	161.5
11	31	0.0000	.6048	-.3493	.4160	.3265	.5357	-169.7	131.1	88.2	53.810	145.0
11	32	0.0000	.7227	-.4173	.5368	.7812	.9331	88.5	71.8	62.2	36.972	124.4
12	33	0.0000	.8333	-.4811	.9345	.9549	.8648	62.3	55.3	47.7	19.492	38.1
12	34	0.0000	.9364	-.5408	.8672	.6821	.4486	47.7	37.1	16.5	44.011	-16.6
12	35	0.0000	1.0396	-.6005	.4588	.3103	.4496	16.3	-33.6	-87.1	58.479	-35.8
		0.0000	1.0911	-.6303			GAP 7			GAP 7	57.056	-45.0
		0.0000	1.0911	-.6303	GAP 8			GAP 8			38.674	10.4
13	36	0.0000	1.1429	-.6602	.4496	.6528	.7643	-87.1	-85.3	-85.7	25.762	6.3
13	37	0.0000	1.2466	-.7199	.7646	.7688	.6652	-86.4	-87.6	-89.3	8.660	-157.5
13	38	0.0000	1.3502	-.7796	.6660	.4690	.2092	-89.4	-92.6	-103.6	38.112	-173.0
14	39	0.0000	1.4601	-.8429	.2098	.1494	.4535	-103.5	120.2	101.6	47.602	-176.2
14	40	0.0000	1.5764	-.9100	.4536	.6924	.8157	101.5	97.9	96.2	26.859	179.6
14	41	0.0000	1.6927	-.9771	.8184	.8010	.6428	96.1	95.0	94.2	12.988	13.1
14	42	0.0000	1.8090	-1.0442	.6550	.3715	.0000	94.1	93.5	-98.7	48.000	4.1
		0.0000	0.0000	0.0000	GAP 9			GAP 9			10.165	-177.9
15	43	.0443	0.0000	.0207	1.5314	1.5169	1.3832	118.0	116.8	115.0	16.461	53.3
15	44	.1330	0.0000	.0621	1.3835	1.1446	.8292	115.2	111.9	105.3	57.934	39.3
15	45	.2216	0.0000	.1035	.8336	.4916	.3102	105.3	87.6	29.5	80.821	36.9
16	46	.3115	0.0000	.1454	.3120	.5458	.8765	30.2	-20.2	-35.0	77.160	34.2
16	47	.4024	0.0000	.1879	.8750	1.1493	1.3234	-34.8	-41.1	-44.7	46.930	27.2
17	48	.5095	0.0000	.2379	1.3230	1.3624	1.1701	-44.5	-47.9	-51.1	15.153	-94.6
17	49	.6327	0.0000	.2953	1.1719	.7802	.2736	-50.8	-55.6	-75.7	67.422	-133.7
17	50	.7559	0.0000	.3528	.2743	.3503	.8488	-74.6	152.8	139.3	78.744	-138.8
18	51	.8759	0.0000	.4088	.8472	1.1939	1.3532	139.1	135.8	134.0	39.253	-144.4
18	52	.9925	0.0000	.4632	1.3561	1.2979	1.0279	134.0	132.8	131.9	25.219	50.2
18	53	1.1092	0.0000	.5176	1.0465	.5894	.0000	131.9	131.2	129.5	79.777	41.9
		0.0000	0.0000	0.0000	GAP 10			GAP 10			10.165	2.1
19	54	-.0443	0.0000	-.0207	1.5314	1.5169	1.3832	-62.0	-63.2	-65.0	16.461	-126.7
19	55	-.1330	0.0000	-.0621	1.3835	1.1446	.8292	-64.8	-68.1	-74.7	57.934	-140.7
19	56	-.2216	0.0000	-.1035	.8336	.4916	.3102	-74.7	-92.4	-150.5	80.821	-143.1
20	57	-.3115	0.0000	-.1454	.3120	.5458	.8765	-149.8	159.8	145.0	77.160	-145.8
20	58	-.4024	0.0000	-.1879	.8750	1.1493	1.3234	145.2	138.9	135.3	46.930	-152.8
21	59	-.5095	0.0000	-.2379	1.3230	1.3624	1.1701	135.5	132.1	128.9	15.153	85.4
21	60	-.6327	0.0000	-.2953	1.1719	.7802	.2736	129.2	124.4	104.3	67.422	46.3
21	61	-.7559	0.0000	-.3528	.2743	.3503	.8488	105.4	-27.2	-40.7	78.744	41.2
22	62	-.8759	0.0000	-.4088	.8472	1.1939	1.3532	-40.9	-44.2	-46.0	39.253	35.6
22	63	-.9925	0.0000	-.4632	1.3561	1.2979	1.0279	-46.0	-47.2	-48.1	25.219	-129.8
22	64	-1.1092	0.0000	-.5176	1.0465	.5894	.0000	-48.1	-48.8	-50.5	79.777	-138.1

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	67.749	149.653	.002511	-.005546	0.000	0.000	67.749	149.653	1000.000	0.0
2	67.749	149.653	.002511	-.005546	0.000	0.000	67.749	149.653	1000.000	-180.0
3					INFINITE	INFINITE	-81.749	38.626	33.540	16.2
6					INFINITE	INFINITE	-81.749	38.626	33.540	-163.8
9					INFINITE	INFINITE	-.000	.000	.000	-120.7
10					INFINITE	INFINITE	.000	-.000	.000	-120.7
4					INFINITE	INFINITE	-600.000	.000	269.731	92.9
7					INFINITE	INFINITE	-600.000	.000	269.731	-87.1

INPUT POWER = 5021.081 WATTS
RADIATED POWER = 4491.051 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 530.031 WATTS
RADIATION EFFICIENCY = 89.44 PER.CENT

EXCITATION MODE 2

GAP NO	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

COORDINATES CURRENT DISTRIBUTION NORMAL ELECTRIC FIELD * RADIUS

RE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1			78.994	43.6
1	1	0.0000	0.0000	.0489	7.1394	7.1188	6.5909	8.3	6.2	4.9	67.676	-46.8
1	2	0.0000	0.0000	.1468	6.6430	5.5979	4.0807	5.3	4.6	4.1	254.173	-82.7
1	3	0.0000	0.0000	.2447	4.1590	2.2328	.0000	4.2	3.8	179.1	412.171	-85.8
		0.0000	0.0000	.0000	GAP 2			GAP 2			78.994	43.6
2	4	0.0000	0.0000	-.0489	7.1394	7.1188	6.5909	8.3	6.2	4.9	67.676	-46.8
2	5	0.0000	0.0000	-.1468	6.6430	5.5979	4.0807	5.3	4.6	4.1	254.173	-82.7
2	6	0.0000	0.0000	-.2447	4.1590	2.2328	.0000	4.2	3.8	179.1	412.171	-85.8
		0.0000	-.0000	-.0000	GAP 3			GAP 3			105.238	153.8
3	7	0.0000	.0423	.0245	3.4828	3.0607	2.4329	-173.5	178.1	166.0	146.249	131.8
3	8	0.0000	.1270	.0735	2.4236	1.7585	1.4348	166.2	144.5	105.3	211.286	112.2
3	9	0.0000	.2117	.1226	1.4346	1.7771	2.4503	105.4	66.7	45.4	211.370	99.8
4	10	0.0000	.2975	.1721	2.4485	3.1054	3.5588	45.5	33.4	25.3	146.745	81.5
4	11	0.0000	.3844	.2223	3.5575	3.7275	3.5876	25.4	18.8	12.5	77.493	21.1
5	12	0.0000	.4868	.2813	3.5878	2.9370	1.9411	12.6	2.1	-17.0	153.868	-50.7
5	13	0.0000	.6048	.3493	1.9419	1.2157	1.7970	-16.8	-67.8	-124.2	218.144	-72.1
5	14	0.0000	.7227	.4173	1.7886	2.7789	3.4540	-124.2	-145.4	-156.1	155.791	-92.1
6	15	0.0000	.8333	.4811	3.4494	3.6078	3.3265	-156.1	-163.2	-170.3	69.338	-171.5
6	16	0.0000	.9364	.5408	3.3269	2.6548	1.7426	-170.4	-179.7	162.8	159.063	123.6
6	17	0.0000	1.0396	.6005	1.7692	1.0525	1.4841	162.4	115.1	53.0	218.227	104.2
		0.0000	1.0911	.6303			GAP 4			GAP 4	213.695	95.4
		0.0000	1.0911	.6303	GAP 5			GAP 5			147.176	142.4
7	18	0.0000	1.1429	.6602	1.4841	2.2726	2.7302	53.0	52.0	50.3	102.194	137.0
7	19	0.0000	1.2466	.7199	2.7282	2.7973	2.4700	49.6	47.6	45.5	26.092	-6.4
7	20	0.0000	1.3502	.7796	2.4691	1.7936	.8745	45.4	42.1	33.1	132.908	-38.0
8	21	0.0000	1.4601	.8429	.8726	.4173	1.5039	33.2	-99.4	-125.0	171.240	-42.9
8	22	0.0000	1.5764	.9100	1.5059	2.3814	2.8476	-125.2	-129.4	-131.4	99.655	-48.1
8	23	0.0000	1.6927	.9771	2.8562	2.8190	2.2747	-131.5	-132.8	-133.8	43.766	147.4
8	24	0.0000	1.8090	1.0442	2.3153	1.3177	.0000	-134.0	-134.9	30.5	169.681	136.0
		0.0000	-.0000	.0000	GAP 6			GAP 6			105.238	153.8
9	25	0.0000	.0423	-.0245	3.4828	3.0607	2.4329	-173.5	178.1	166.0	146.249	131.8
9	26	0.0000	.1270	-.0735	2.4236	1.7585	1.4348	166.2	144.5	105.3	211.286	112.2
9	27	0.0000	.2117	-.1226	1.4346	1.7771	2.4503	105.4	66.7	45.4	211.370	99.8
10	28	0.0000	.2975	-.1721	2.4485	3.1054	3.5588	45.5	33.4	25.3	146.745	81.5
10	29	0.0000	.3844	-.2223	3.5575	3.7275	3.5876	25.4	18.8	12.5	77.493	21.1
11	30	0.0000	.4868	-.2813	3.5878	2.9370	1.9411	12.6	2.1	-17.0	153.868	-50.7
11	31	0.0000	.6048	-.3493	1.9419	1.2157	1.7970	-16.8	-67.8	-124.2	218.144	-72.1
11	32	0.0000	.7227	-.4173	1.7886	2.7789	3.4540	-124.2	-145.4	-156.1	155.791	-92.1
12	33	0.0000	.8333	-.4811	3.4494	3.6078	3.3265	-156.1	-163.2	-170.3	69.338	-171.5
12	34	0.0000	.9364	-.5408	3.3269	2.6548	1.7426	-170.4	-179.7	162.8	159.063	123.6
12	35	0.0000	1.0396	-.6005	1.7692	1.0525	1.4841	162.4	115.1	53.0	218.227	104.2
		0.0000	1.0911	-.6303			GAP 7			GAP 7	213.695	95.4
		0.0000	1.0911	-.6303	GAP 8			GAP 8			147.176	142.4
13	36	0.0000	1.1429	-.6602	1.4841	2.2726	2.7302	53.0	52.0	50.3	102.194	137.0
13	37	0.0000	1.2466	-.7199	2.7282	2.7973	2.4700	49.6	47.6	45.5	26.092	-6.4
13	38	0.0000	1.3502	-.7796	2.4691	1.7936	.8745	45.4	42.1	33.1	132.908	-38.0
14	39	0.0000	1.4601	-.8429	.8726	.4173	1.5039	33.2	-99.4	-125.0	171.240	-42.9

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
14	40	0.0000	1.5764	-.9100	1.5059	2.3814	2.8476	-125.2	-129.4	-131.4	99.655	-48.1
14	41	0.0000	1.6927	-.9771	2.8562	2.8190	2.2747	-131.5	-132.8	-133.8	43.266	147.4
14	42	0.0000	1.8090	-1.0442	2.3153	1.3177	.0000	-134.0	-134.9	30.5	169.681	136.0
		0.0000	0.0000	0.0000	GAP 9			GAP 9			103.319	-45.7
15	43	.0443	0.0000	.0207	.2815	.6816	.8179	-120.7	-129.2	-129.6	53.687	-44.2
15	44	.1330	0.0000	.0621	.7400	.6751	.4955	-128.8	-126.8	-121.6	25.394	127.1
15	45	.2216	0.0000	.1035	.4819	.2370	.2048	-121.4	-100.2	-6.4	59.296	130.5
16	46	.3115	0.0000	.1454	.2081	.5119	.8203	-4.9	23.8	30.1	63.888	130.5
16	47	.4024	0.0000	.1879	.8250	1.0752	1.2341	30.1	32.5	33.3	39.936	129.8
17	48	.5095	0.0000	.2379	1.2402	1.2759	1.0922	33.3	33.4	32.2	10.840	-48.6
17	49	.6327	0.0000	.2953	1.0993	.7243	.2373	32.1	28.3	6.2	64.595	-51.3
17	50	.7559	0.0000	.3528	.2416	.3729	.8628	6.0	-122.6	-134.6	76.823	-52.9
18	51	.8759	0.0000	.4088	.8638	1.2057	1.3635	-134.6	-137.7	-139.2	38.685	-57.2
18	52	.9925	0.0000	.4632	1.3689	1.3104	1.0389	-139.3	-140.3	-141.1	25.322	136.4
18	53	1.1092	0.0000	.5176	1.0597	.5981	.0000	-141.2	-141.9	-143.5	80.780	128.8
		0.0000	0.0000	0.0000	GAP 10			GAP 10			103.319	-45.7
19	54	-.0443	0.0000	-.0207	.2815	.6816	.8179	-120.7	-129.2	-129.6	53.687	-44.2
19	55	-.1330	0.0000	-.0621	.7400	.6751	.4955	-128.8	-126.8	-121.6	25.394	127.1
19	56	-.2216	0.0000	-.1035	.4819	.2370	.2048	-121.4	-100.2	-6.4	59.296	130.5
20	57	-.3115	0.0000	-.1454	.2081	.5119	.8203	-4.9	23.8	30.1	63.888	130.5
20	58	-.4024	0.0000	-.1879	.8250	1.0752	1.2341	30.1	32.5	33.3	39.936	129.8
21	59	-.5095	0.0000	-.2379	1.2402	1.2759	1.0922	33.3	33.4	32.2	10.840	-48.6
21	60	-.6327	0.0000	-.2953	1.0993	.7243	.2373	32.1	28.3	6.2	64.595	-51.3
21	61	-.7559	0.0000	-.3528	.2416	.3729	.8628	6.0	-122.6	-134.6	76.823	-52.9
22	62	-.8759	0.0000	-.4088	.8638	1.2057	1.3635	-134.6	-137.7	-139.2	38.685	-57.2
22	63	-.9925	0.0000	-.4632	1.3689	1.3104	1.0389	-139.3	-140.3	-141.1	25.322	136.4
22	64	-1.1092	0.0000	-.5176	1.0597	.5981	.0000	-141.2	-141.9	-143.5	80.780	128.8

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	138.592	-20.272	.007064	.001033	0.000	0.000	138.592	-20.272	1000.000	0.0
2	138.592	-20.272	.007064	.001033	0.000	0.000	138.592	-20.272	1000.000	0.0
3					INFINITE	INFINITE	-81.749	38.626	314.903	-18.8
6					INFINITE	INFINITE	-81.749	38.626	314.903	-18.8
9					INFINITE	INFINITE	.000	4515.034	1271.220	-30.7
10					INFINITE	INFINITE	.000	4515.034	1271.220	-30.7
4					INFINITE	INFINITE	-600.000	.000	890.455	53.0
7					INFINITE	INFINITE	-600.000	0.000	890.455	53.0

INPUT POWER = 14128.555 WATTS
RADIATED POWER = 4875.930 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 9252.625 WATTS
RADIATION EFFICIENCY = 34.51 PER CENT

WIRE COORDINATES IN FEET AND WIRE RADII IN INCHES

WIRE NO		X1	Y1	Z1	RAD1		X2	Y2	Z2	RAD2	INTERVALS
1	GAP 1	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	61.5000	.250000	3
2	GAP 2	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	-61.5000	.250000	3
3	GAP 3	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	30.8000	.250000	3
4		-0.0000	53.2000	30.8000	.250000		-0.0000	89.6000	51.8000	.250000	2
5		-0.0000	89.6000	51.8000	.250000		-0.0000	163.7000	94.5000	.250000	4
6		-0.0000	163.7000	94.5000	.250000	GAP 4	-0.0000	228.5000	132.0000	.250000	3
7	GAP 5	-0.0000	228.5000	132.0000	.250000		-0.0000	293.6000	169.5000	.250000	3
8		-0.0000	293.6000	169.5000	.250000		-0.0000	391.0000	225.7000	.250000	5
9	GAP 6	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	-30.8000	.250000	3
10		-0.0000	53.2000	-30.8000	.250000		-0.0000	89.6000	-51.8000	.250000	2
11		-0.0000	89.6000	-51.8000	.250000		-0.0000	163.7000	-94.5000	.250000	4
12		-0.0000	163.7000	-94.5000	.250000	GAP 7	-0.0000	228.5000	-132.0000	.250000	3
13	GAP 8	-0.0000	228.5000	-132.0000	.250000		-0.0000	293.6000	-169.5000	.250000	3
14		-0.0000	293.6000	-169.5000	.250000		-0.0000	391.0000	-225.7000	.250000	5
15	GAP 9	-0.0000	-0.0000	-0.0000	.290000		55.7000	-0.0000	26.0000	.290000	3
16		55.7000	-0.0000	26.0000	.290000		93.8000	-0.0000	43.8000	.290000	2
17		93.8000	-0.0000	43.8000	.290000		171.2000	-0.0000	79.9000	.290000	4
18		171.2000	-0.0000	79.9000	.290000		244.5000	-0.0000	114.1000	.290000	4
19	GAP 10	-0.0000	-0.0000	-0.0000	.290000		-55.7000	-0.0000	-26.0000	.290000	3
20		-55.7000	-0.0000	-26.0000	.290000		-93.8000	-0.0000	-43.8000	.290000	2
21		-93.8000	-0.0000	-43.8000	.290000		-171.2000	-0.0000	-79.9000	.290000	4
22		-171.2000	-0.0000	-79.9000	.290000		-244.5000	-0.0000	-114.1000	.290000	4

FREQUENCY = 6.5500 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 350

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 20.8 PER CENT FOR GAPS 4 AND

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS

NET NO	NETTYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000

WIRE NO	INT NO	COORDINATES X WAVELENGTHS	COORDINATES Y WAVELENGTHS	COORDINATES Z WAVELENGTHS	CURRENT DISTRIBUTION AMPLITUDE			CURRENT DISTRIBUTION PHASE			NORMAL ELECTRIC FIELD * RADIUS VOLTS	NORMAL ELECTRIC FIELD * RADIUS DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			187.221	-1.7
1	1	0.0000	0.0000	.0682	1.1184	2.0949	2.6284	-51.1	-72.2	-78.2	123.429	-5.5
1	2	0.0000	0.0000	.2046	2.5460	2.5337	2.0494	-77.5	-80.5	-82.4	38.516	-148.4
1	3	0.0000	0.0000	.3411	2.0738	1.1758	.0000	-82.3	-83.6	-81.8	149.703	-172.3
		0.0000	0.0000	0.0000	GAP 2			GAP 2			187.221	178.3
2	4	0.0000	0.0000	-.0682	1.1184	2.0949	2.6284	128.9	107.8	101.8	123.429	174.5
2	5	0.0000	0.0000	-.2046	2.5460	2.5337	2.0494	102.5	99.5	97.6	38.516	31.6
2	6	0.0000	0.0000	-.3411	2.0738	1.1758	.0000	97.7	96.4	98.2	149.703	7.7
		0.0000	0.0000	0.0000	GAP 3			GAP 3			17.659	-171.5
3	7	0.0000	.0590	.0342	.0904	.1400	.1893	-178.1	128.6	108.2	13.953	165.9
3	8	0.0000	.1770	.1025	.1777	.2111	.2426	103.1	80.6	59.3	12.138	102.2
3	9	0.0000	.2950	.1708	.2458	.2739	.2940	59.1	39.5	20.8	13.204	54.4
4	10	0.0000	.414	.2399	.2984	.3054	.2988	21.0	2.3	-17.8	14.019	1.7
4	11	0.0000	.535	.3098	.3021	.2871	.2760	-17.4	-39.9	-65.7	16.757	-47.3
5	12	0.0000	.657	.3802	.2779	.2798	.2956	-65.2	-92.7	-118.7	17.969	-88.5
5	13	0.0000	.781	.4513	.2964	.3135	.3209	-118.3	-141.5	-162.6	16.737	-134.9
5	14	0.0000	.904	.5223	.3215	.3124	.2915	-162.3	176.6	153.5	16.110	168.7
5	15	0.0000	1.027	.5934	.2917	.2701	.2640	153.9	127.2	97.7	18.232	120.5

WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
6	16	0.0000	1.1613	.6705	.2630	.2789	.3013	98.1	65.2	37.5	17.240	74.4
6	17	0.0000	1.3050	.7537	.3008	.3046	.2802	37.5	13.3	-11.4	14.514	8.6
6	18	0.0000	1.4488	.8368	.2870	.2405	.2161	-11.2	-41.8	-85.5	18.595	-58.9
		0.0000	1.5206	.8784			GAP 4			GAP 4	20.745	-82.3
		0.0000	1.5206	.8784	GAP 5			GAP 5			2.858	49.8
7	19	0.0000	1.5928	.9200	.2161	.2009	.1250	-85.5	-82.4	-82.6	5.492	-179.4
7	20	0.0000	1.7372	1.0032	.1231	.0151	.1130	-85.8	-139.0	105.2	14.100	-170.5
7	21	0.0000	1.8816	1.0864	.1144	.2063	.2447	105.4	101.3	99.2	7.896	-176.2
8	22	0.0000	2.0187	1.1654	.2458	.2246	.1544	99.1	97.2	93.9	6.163	17.8
8	23	0.0000	2.1483	1.2402	.1550	.0522	.0710	93.9	79.1	-66.0	14.764	10.2
8	24	0.0000	2.2779	1.3150	.0710	.1737	.2416	-66.3	-75.9	-78.6	11.448	6.4
8	25	0.0000	2.4076	1.3898	.2427	.2589	.2185	-78.7	-80.2	-81.2	1.729	-147.9
8	26	0.0000	2.5372	1.4646	.2232	.1302	.0000	-81.4	-82.3	92.8	14.777	-171.4
		0.0000	0.0000	0.0000	GAP 6			GAP 6			17.659	8.5
9	27	0.0000	.0590	-.0342	.0904	.1400	.1893	1.9	-51.4	-76.8	13.953	-14.1
9	28	0.0000	.1770	-.1025	.1777	.2111	.2426	-76.9	-99.4	-120.7	12.138	-77.8
9	29	0.0000	.2950	-.1708	.2458	.2739	.2940	-120.9	-140.5	-159.2	13.204	-125.6
10	30	0.0000	.4146	-.2399	.2984	.3054	.2988	-159.0	-177.7	162.2	14.019	-178.3
10	31	0.0000	.5357	-.3098	.3021	.2871	.2760	162.6	140.1	114.3	16.757	132.7
11	32	0.0000	.6579	-.3802	.2779	.2798	.2956	114.8	87.3	61.3	17.969	91.5
11	33	0.0000	.7812	-.4513	.2964	.3135	.3209	61.7	38.5	17.4	16.237	45.1
11	34	0.0000	.9045	-.5223	.3215	.3124	.2915	17.7	-3.4	-26.5	16.110	-11.3
11	35	0.0000	1.0278	-.5934	.2917	.2701	.2640	-26.1	-52.8	-82.3	18.232	-59.5
12	36	0.0000	1.1613	-.6705	.2630	.2789	.3013	-81.9	-114.8	-142.5	17.240	-105.6
12	37	0.0000	1.3050	-.7537	.3008	.3046	.2802	-142.5	-166.7	168.6	14.514	-171.4
12	38	0.0000	1.4488	-.8368	.2870	.2405	.2161	168.8	138.2	94.5	18.595	121.1
		0.0000	1.5206	-.8784			GAP 7			GAP 7	20.745	-97.7
		0.0000	1.5206	-.8784	GAP 8			GAP 8			2.858	-130.2
13	39	0.0000	1.5928	-.9200	.2161	.2009	.1250	94.5	97.6	97.4	5.492	.6
13	40	0.0000	1.7372	-1.0032	.1231	.0151	.1130	94.2	141.0	-74.8	14.100	9.5
13	41	0.0000	1.8816	-1.0864	.1144	.2063	.2447	-74.6	-78.7	-80.8	7.896	-3.8
14	42	0.0000	2.0187	-1.1654	.2458	.2246	.1544	-80.9	-82.8	-86.1	6.163	-162.2
14	43	0.0000	2.1483	-1.2402	.1550	.0522	.0710	-86.1	-100.9	114.0	14.764	-169.8
14	44	0.0000	2.2779	-1.3150	.0710	.1737	.2416	113.7	104.1	101.4	11.448	-173.6
14	45	0.0000	2.4076	-1.3898	.2427	.2589	.2185	101.3	99.8	98.8	1.729	32.1
14	46	0.0000	2.5372	-1.4646	.2232	.1302	.0000	98.6	97.7	87.2	14.777	8.6
		0.0000	0.0000	0.0000	GAP 9			GAP 9			12.943	-175.2
15	47	.0618	0.0000	.0288	.5762	.6051	.5163	111.2	108.2	103.5	6.855	68.3
15	48	.1853	0.0000	.0865	.5100	.3327	.1610	103.7	92.4	45.6	32.240	31.5
15	49	.3089	0.0000	.1442	.1636	.2632	.4668	46.0	-26.5	-45.1	35.923	25.7
16	50	.4341	0.0000	.2026	.4668	.6166	.6652	-44.6	-52.0	-56.6	16.224	-8.4
16	51	.5608	0.0000	.2619	.6662	.6001	.4323	-56.3	-60.7	-67.5	18.056	-127.3
17	52	.6886	0.0000	.3215	.4340	.2018	.1577	-67.1	-87.6	168.8	37.423	-143.1
17	53	.8174	0.0000	.3816	.1555	.3832	.5631	169.0	138.9	131.5	31.260	-150.7
17	54	.9461	0.0000	.4416	.5621	.6381	.5935	131.6	127.6	124.3	15.561	151.0
17	55	1.0749	0.0000	.5017	.5938	.4368	.2018	124.4	120.1	107.9	28.099	42.6
18	56	1.2003	0.0000	.5602	.2020	.0977	.3294	108.4	-11.5	-43.4	37.761	35.9
18	57	1.3222	0.0000	.6171	.3289	.5205	.6229	-43.7	-49.0	-51.4	21.950	30.1
18	58	1.4442	0.0000	.6740	.6244	.6168	.4983	-51.6	-53.1	-54.2	9.417	-131.2
18	59	1.5661	0.0000	.7309	.5078	.2895	.0000	-54.3	-55.3	-56.7	37.130	-144.3
		0.0000	0.0000	0.0000	GAP 10			GAP 10			12.943	4.8
19	60	-.0618	0.0000	-.0288	.5762	.6051	.5163	-68.8	-71.8	-76.5	6.855	-111.7

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
19	61	-.1853	0.0000	-.0865	.5100	.3327	.1610	-76.3	-87.6	-134.4	32.240	-148.5
19	62	-.3089	0.0000	-.1442	.1636	.2632	.4668	-134.0	153.5	134.9	35.923	-154.3
20	63	-.4341	0.0000	-.2026	.4668	.6166	.6652	135.4	128.0	123.4	16.224	-171.6
20	64	-.5608	0.0000	-.2619	.6662	.6001	.4323	123.7	119.3	112.5	18.056	52.7
21	65	-.6886	0.0000	-.3215	.4340	.2018	.1577	112.9	92.4	-11.2	37.423	36.9
21	66	-.8174	0.0000	-.3816	.1555	.3832	.5631	-11.0	-41.1	-48.5	31.260	29.3
21	67	-.9461	0.0000	-.4416	.5621	.6381	.5935	-48.4	-52.4	-55.7	5.561	-29.0
21	68	-1.0749	0.0000	-.5017	.5938	.4368	.2018	-55.6	-59.9	-72.1	28.099	-137.4
22	69	-1.2003	0.0000	-.5602	.2020	.0977	.3294	-71.6	168.5	136.6	37.761	-144.1
22	70	-1.3222	0.0000	-.6171	.3289	.5205	.6229	136.3	131.0	128.6	21.950	-149.9
22	71	-1.4442	0.0000	-.6740	.6244	.6168	.4983	128.4	126.9	125.8	9.417	48.8
22	72	-1.5661	0.0000	-.7309	.5078	.2895	.0000	125.7	124.7	123.3	37.130	35.7

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	DEGREES
1	561.466	695.914	.000702	-.000870	0.000	0.000	561.466	695.914	1000.000	0.0
2	561.466	695.914	.000702	-.000870	0.000	0.000	561.466	695.914	1000.000	-180.0
3					INFINITE	INFINITE	-69.755	45.932	7.550	-31.4
6					INFINITE	INFINITE	-69.755	45.932	7.550	148.6
9					INFINITE	INFINITE	.000	.000	.000	-161.0
10					INFINITE	INFINITE	-.000	-.000	.000	-161.0
4					INFINITE	INFINITE	-600.000	.000	129.674	-85.5
7					INFINITE	INFINITE	-600.000	-.000	129.674	94.5

INPUT POWER = 1404.472 WATTS
RADIATED POWER = 1290.089 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 114.383 WATTS
RADIATION EFFICIENCY = 91.86 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

		COORDINATES			CURRENT DISTRIBUTION					NORMAL ELECTRIC FIELD * RADIUS	
		X	Y	Z	AMPLITUDE		PHASE				
WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	0.0000	GAP 1			GAP 1			162.256	12.9
1	1	0.0000	0.0000	.0682	1.3766	2.2579	2.7220	-45.4	-58.8	-63.1	106.245	10.4
1	2	0.0000	0.0000	.2046	2.6850	2.6376	2.1196	-62.3	-64.2	-65.5	41.998	-140.2
1	3	0.0000	0.0000	.3411	2.1574	1.2222	.0000	-65.4	-66.4	-65.1	155.740	-155.4
		0.0000	0.0000	0.0000	GAP 2			GAP 2			162.256	12.9
2	4	0.0000	0.0000	-.0682	1.3766	2.2579	2.7220	-45.4	-58.8	-63.1	106.245	10.4
2	5	0.0000	0.0000	-.2046	2.6850	2.6376	2.1196	-62.3	-64.2	-65.5	41.998	-140.2
2	6	0.0000	0.0000	-.3411	2.1574	1.2222	.0000	-65.4	-66.4	-65.1	155.740	-155.4
		0.0000	0.0000	0.0000	GAP 3			GAP 3			59.574	153.0
3	7	0.0000	.0590	.0342	.6629	.8071	.8469	129.6	102.5	79.9	47.363	119.5
3	8	0.0000	.1770	.1025	.8089	.8058	.8266	78.4	52.6	25.7	52.364	53.3
3	9	0.0000	.2950	.1708	.8276	.8825	.9411	25.4	-.0	-22.5	52.384	9.6
4	10	0.0000	.4146	.2399	.9431	.9704	.9475	-22.5	-43.4	-64.2	47.547	-43.0
4	11	0.0000	.5357	.3098	.9482	.8848	.8195	-64.1	-86.8	-113.2	52.513	-97.7
5	12	0.0000	.6579	.3802	.8187	.7968	.8358	-113.1	-142.9	-171.7	56.244	-141.3
5	13	0.0000	.7812	.4513	.8341	.8957	.9303	-171.6	163.3	141.5	49.139	172.1
5	14	0.0000	.9045	.5223	.9295	.9084	.8387	141.5	120.4	97.2	46.594	112.2
5	15	0.0000	1.0278	.5934	.8380	.7607	.7369	97.4	69.8	38.1	54.375	61.3
6	16	0.0000	1.1613	.6705	.7337	.8004	.8965	38.2	3.1	-25.0	52.103	15.8
6	17	0.0000	1.3050	.7537	.8963	.9299	.8629	-25.3	-48.8	-72.6	42.507	-51.4
6	18	0.0000	1.4488	.8368	.8850	.7382	.6594	-72.4	-102.3	-146.4	56.999	-120.4
		0.0000	1.5206	.8784			GAP 4			GAP 4	64.374	-142.9
		0.0000	1.5206	.8784	GAP 5			GAP 5			8.142	-13.0
7	19	0.0000	1.5928	.9200	.6594	.6133	.3866	-146.4	-144.0	-145.9	16.372	122.8
7	20	0.0000	1.7372	1.0032	.3827	.0736	.3312	-149.1	158.0	49.6	42.270	129.6
7	21	0.0000	1.8816	1.0864	.3347	.6094	.7266	49.8	43.2	40.2	24.029	122.3
8	22	0.0000	2.0187	1.1654	.7289	.6694	.4646	40.2	37.8	34.2	17.959	-39.5
8	23	0.0000	2.1483	1.2402	.4656	.1637	.2002	34.3	19.8	-124.4	43.451	-49.4
8	24	0.0000	2.2779	1.3150	.2001	.5025	.7031	-124.9	-135.6	-138.5	33.817	-53.8
8	25	0.0000	2.4076	1.3898	.7060	.7550	.6379	-138.7	-140.2	-141.3	4.951	154.4

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
8	26	0.0000	2.5372	-1.4646	.6511	.3799	.0000	-141.6	-142.5	-32.3	43.114	128.4
		0.0000	0.0000	0.0000	GAP 6			GAP 6			59.574	153.0
9	27	0.0000	.0590	-.0342	.6629	.8071	.8469	129.6	102.5	79.9	47.363	119.5
9	28	0.0000	.1770	-.1025	.8089	.8058	.8266	-78.4	-52.6	-25.7	52.364	-53.3
9	29	0.0000	.2950	-.1708	.8276	.8825	.9411	25.4	-.0	-22.5	52.384	9.6
10	30	0.0000	.4146	-.2399	.9431	.9704	.9475	-22.5	-43.4	-64.2	47.547	-43.0
10	31	0.0000	.5357	-.3098	.9482	.8848	.8195	-64.1	-86.8	-113.2	52.513	-97.7
11	32	0.0000	.6579	-.3802	.8187	.7968	.8358	-113.1	-142.9	-171.7	56.244	-141.3
11	33	0.0000	.7812	-.4513	.8341	.8957	.9303	-171.6	163.3	141.5	49.139	172.1
11	34	0.0000	.9045	-.5223	.9295	.9084	.8387	141.5	120.4	97.2	46.594	112.2
11	35	0.0000	1.0278	-.5934	.8380	.7607	.7369	97.4	69.8	38.1	54.375	61.3
12	36	0.0000	1.1613	-.6705	.7337	.8004	.8965	38.2	3.1	-25.0	52.103	15.8
12	37	0.0000	1.3050	-.7537	.8963	.9299	.8629	-25.3	-48.8	-72.6	42.507	-51.4
12	38	0.0000	1.4488	-.8368	.8850	.7382	.6594	-72.4	-102.3	-146.4	56.999	-120.4
		0.0000	1.5206	-.8784			GAP 7			GAP 7	64.374	-142.9
		0.0000	1.5206	-.8784	GAP 8			GAP 8			8.142	-13.0
13	39	0.0000	1.5928	-.9200	.6594	.6133	.3866	-146.4	-144.0	-145.9	16.372	122.8
13	40	0.0000	1.7372	-1.0032	.3827	.0736	.3312	-149.1	158.0	49.6	42.270	129.6
13	41	0.0000	1.8816	-1.0864	.3347	.6094	.7266	49.8	43.2	40.2	24.029	122.3
14	42	0.0000	2.0187	-1.1654	.7289	.6694	.4646	40.2	37.8	34.2	17.959	-39.5
14	43	0.0000	2.1483	-1.2402	.4656	.1637	.2002	34.3	19.8	-124.4	43.451	-49.4
14	44	0.0000	2.2779	-1.3150	.2001	.5025	.7031	-124.9	-135.6	-138.5	33.817	-53.8
14	45	0.0000	2.4076	-1.3898	.7060	.7550	.6379	-138.7	-140.2	-141.3	4.951	154.4
14	46	0.0000	2.5372	-1.4646	.6511	.3799	.0000	-141.6	-142.5	32.3	43.114	128.4
		0.0000	0.0000	0.0000	GAP 9			GAP 9			53.056	-121.3
15	47	.0618	0.0000	.0288	.1294	.3757	.4303	-161.0	162.5	157.1	24.915	-127.4
15	48	.1853	0.0000	.0865	.3657	.2554	.0672	158.4	154.1	135.3	22.024	73.3
15	49	.3089	0.0000	.1442	.0560	.1792	.3881	131.5	-15.0	-20.8	31.669	65.8
16	50	.4341	0.0000	.2026	.3933	.5455	.6004	-20.9	-23.4	-25.6	14.877	55.5
16	51	.5608	0.0000	.2619	.6035	.5479	.3905	-25.7	-28.3	-33.0	15.648	-102.6
17	52	.6886	0.0000	.3215	.3923	.1650	.1441	-33.1	-50.5	-173.3	35.538	-112.7
17	53	.8174	0.0000	.3816	.1441	.3793	.5568	-173.1	165.3	160.0	30.112	-118.7
17	54	.9461	0.0000	.4416	.5575	.6315	.5860	160.0	156.9	153.9	4.660	-177.9
17	55	1.0749	0.0000	.5017	.5872	.4301	.1959	154.0	149.7	136.6	28.114	72.4
18	56	1.2003	0.0000	.5602	.1964	.1065	.3382	136.9	18.0	-12.4	37.799	66.4
18	57	1.3222	0.0000	.6171	.3380	.5293	.6312	-12.6	-18.0	-20.5	21.934	60.6
18	58	1.4442	0.0000	.6740	.6330	.6242	.5037	-20.6	-22.2	-23.4	9.661	-100.1
18	59	1.5661	0.0000	.7309	.5134	.2925	.0000	-23.5	-24.5	-26.0	37.542	-113.5
		0.0000	0.0000	0.0000	GAP 10			GAP 10			53.056	-121.3
19	60	-.0618	0.0000	-.0288	.1294	.3757	.4303	-161.0	162.5	157.1	24.915	-127.4
19	61	-.1853	0.0000	-.0865	.3657	.2554	.0672	158.4	154.1	135.3	22.024	73.3
19	62	-.3089	0.0000	-.1442	.0560	.1792	.3881	131.5	-15.0	-20.8	31.669	65.8
20	63	-.4341	0.0000	-.2026	.3933	.5455	.6004	-20.9	-23.4	-25.6	14.877	55.5
20	64	-.5608	0.0000	-.2619	.6035	.5479	.3905	-25.7	-28.3	-33.0	15.648	-102.6
21	65	-.6886	0.0000	-.3215	.3923	.1650	.1441	-33.1	-50.5	-173.3	35.538	-112.7
21	66	-.8174	0.0000	-.3816	.1441	.3793	.5568	-173.1	165.3	160.0	30.112	-118.7
21	67	-.9461	0.0000	-.4416	.5575	.6315	.5860	160.0	156.9	153.9	4.660	-177.9
21	68	-1.0749	0.0000	-.5017	.5872	.4301	.1959	154.0	149.7	136.6	28.114	72.4
22	69	-1.2003	0.0000	-.5602	.1964	.1065	.3382	136.9	18.0	-12.4	37.799	66.4
22	70	-1.3222	0.0000	-.6171	.3380	.5293	.6312	-12.6	-18.0	-20.5	21.934	60.6
22	71	-1.4442	0.0000	-.6740	.6330	.6242	.5037	-20.6	-22.2	-23.4	9.661	-100.1
22	72	-1.5661	0.0000	-.7309	.5134	.2925	.0000	-23.5	-24.5	-26.0	37.542	-113.5

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	510.402	516.886	.000967	-.000980	0.000	0.000	510.402	516.886	1000.000	0.0
2	510.402	516.886	.000967	-.000980	0.000	0.000	510.402	516.886	1000.000	0.0
3					INFINITE	INFINITE	-69.755	45.932	55.365	-83.8
6					INFINITE	INFINITE	-69.755	45.932	55.365	-83.8
9					INFINITE	INFINITE	.000	3239.795	419.233	-71.0
10					INFINITE	INFINITE	.000	3239.795	419.233	-71.0
4					INFINITE	INFINITE	-600.000	-.000	395.648	-146.4
7					INFINITE	INFINITE	-600.000	-.000	395.648	-146.4

INPUT POWER = 1934.507 WATTS
RADIATED POWER = 768.311 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 1166.196 WATTS
RADIATION EFFICIENCY = 39.72 PER CENT

WIRE COORDINATES IN FEET AND WIRE RADII IN INCHES

WIRE NO		X1	Y1	Z1	RAD1		X2	Y2	Z2	RAD2	INTERVALS
1	GAP 1	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	61.5000	.250000	4
2	GAP 2	-0.0000	-0.0000	-0.0000	.250000		-0.0000	-0.0000	-61.5000	.250000	4
3	GAP 3	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	30.8000	.250000	4
4		-0.0000	53.2000	30.8000	.250000		-0.0000	89.6000	51.8000	.250000	3
5		-0.0000	89.6000	51.8000	.250000		-0.0000	163.7000	94.5000	.250000	5
6		-0.0000	163.7000	94.5000	.250000	GAP 4	-0.0000	228.5000	132.0000	.250000	5
7	GAP 5	-0.0000	228.5000	132.0000	.250000		-0.0000	293.6000	169.5000	.250000	5
8		-0.0000	293.6000	169.5000	.250000		-0.0000	391.0000	225.7000	.250000	7
9	GAP 6	-0.0000	-0.0000	-0.0000	.250000		-0.0000	53.2000	-30.8000	.250000	4
10		-0.0000	53.2000	-30.8000	.250000		-0.0000	89.6000	-51.8000	.250000	3
11		-0.0000	89.6000	-51.8000	.250000		-0.0000	163.7000	-94.5000	.250000	5
12		-0.0000	163.7000	-94.5000	.250000	GAP 7	-0.0000	228.5000	-132.0000	.250000	5
13	GAP 8	-0.0000	228.5000	-132.0000	.250000		-0.0000	293.6000	-169.5000	.250000	5
14		-0.0000	293.6000	-169.5000	.250000		-0.0000	391.0000	-225.7000	.250000	7
15	GAP 9	-0.0000	-0.0000	-0.0000	.290000		55.7000	-0.0000	26.0000	.290000	4
16		55.7000	-0.0000	26.0000	.290000		93.8000	-0.0000	43.8000	.290000	3
17		93.8000	-0.0000	43.8000	.290000		171.2000	-0.0000	79.9000	.290000	5
18		171.2000	-0.0000	79.9000	.290000		244.5000	-0.0000	114.1000	.290000	5
19	GAP 10	-0.0000	-0.0000	-0.0000	.290000		-55.7000	-0.0000	-26.0000	.290000	4
20		-55.7000	-0.0000	-26.0000	.290000		-93.8000	-0.0000	-43.8000	.290000	3
21		-93.8000	-0.0000	-43.8000	.290000		-171.2000	-0.0000	-79.9000	.290000	5
22		-171.2000	-0.0000	-79.9000	.290000		-244.5000	-0.0000	-114.1000	.290000	5

FREQUENCY = 9.1800 MC

NO GROUND PRESENT

ANTENNA MODE SOLUTIONS WERE READ FROM BINARY CARDS DECK NO. 353

MAXIMUM RELATIVE ASYMMETRY IN THE ANTENNA ADMITTANCE MATRIX IS 16.5 PER CENT FOR GAPS 3 AND 1

EXCITATION MODE 1

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	180.00	-0.0000	-0.0000	INFINITY	SERIES

NONRADIATING NETWORKS CONNECTING THE GAPS.

NET NO.	NET TYPE	GAP CONNECTIONS	PARAM1	PARAM2	PARAM3	PARAM4
1	IMP	3- 0	100.0000	-0.0000	-0.0000	-0.0000
2	IMP	6- 0	100.0000	-0.0000	-0.0000	-0.0000
3	IMP	3- 0	-0.0000	-0.0000	160.0000	-0.0000
4	IMP	6- 0	-0.0000	-0.0000	160.0000	-0.0000
5	IMP	4- 0	600.0000	-0.0000	-0.0000	-0.0000
6	IMP	7- 0	600.0000	-0.0000	-0.0000	-0.0000
7	IMP	9- 0	-0.0000	-0.0000	15.0000	-0.0000
8	IMP	9- 10	-0.0000	-0.0000	-0.0000	-0.0000

COORDINATES CURRENT DISTRIBUTION NORMAL ELECTRIC FIELD * RADIUS

WIRE NO	INT NO	X WAVE-LENGTHS	-Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1			199.154	-1.4
1	1	0.0000	0.0000	.0717	1.8226	.5313	1.1446	73.2	27.1	-70.1	194.599	-2.8
1	2	0.0000	0.0000	.2151	1.0385	1.9694	2.5309	-67.6	-81.5	-85.9	108.830	-7.9
1	3	0.0000	0.0000	.3585	2.5202	2.5768	2.1209	-85.8	-88.1	-89.6	29.476	-156.6
1	4	0.0000	0.0000	.5019	2.1604	1.2407	.0000	-89.6	-90.6	-92.6	148.846	-179.6
		0.0000	0.0000	.0000	GAP 2			GAP 2			199.154	178.6
2	5	0.0000	0.0000	-.0717	1.8226	.5313	1.1446	-106.8	-152.9	109.9	194.599	177.2
2	6	0.0000	0.0000	-.2151	1.0385	1.9694	2.5309	112.4	98.5	94.1	108.830	172.1
2	7	0.0000	0.0000	-.3585	2.5202	2.5768	2.1209	94.2	91.9	90.4	29.476	23.4
2	8	0.0000	0.0000	-.5019	2.1604	1.2407	.0000	90.4	89.4	87.4	148.846	.4
		0.0000	0.0000	0.0000	GAP 3			GAP 3			22.433	179.1
3	9	0.0000	.0620	.0359	.1518	.0198	.0881	-87.4	-19.1	58.0	15.843	170.0
3	10	0.0000	.1861	.1077	.0702	.1140	.1371	46.3	41.7	27.6	5.111	99.9
3	11	0.0000	.3101	.1795	.1388	.1511	.1638	26.0	6.2	-17.2	7.847	16.2
3	12	0.0000	.4342	.2514	.1683	.1869	.2077	-17.3	-40.4	-61.6	10.090	-25.0
4	13	0.0000	.5528	.3199	.2110	.2246	.2287	-61.1	-78.6	-95.7	9.903	-71.0
4	14	0.0000	.6659	.3852	.2310	.2243	.2112	-95.3	-113.2	-133.8	11.068	-121.8
4	15	0.0000	.7791	.4505	.2128	.2006	.1987	-133.4	-157.2	176.6	13.114	-162.6
5	16	0.0000	.9048	.5230	.1999	.2125	.2310	177.2	146.7	120.4	12.904	156.4
5	17	0.0000	1.0430	.6026	.2317	.2390	.2303	121.1	97.9	74.6	11.376	97.4
5	18	0.0000	1.1813	.6823	.2309	.2106	.1965	75.2	48.6	16.8	13.136	37.8
5	19	0.0000	1.3195	.7619	.1963	.2008	.2191	17.4	-15.9	-44.9	13.457	-8.6
5	20	0.0000	1.4577	.8416	.2189	.2313	.2266	-44.6	-69.0	-91.9	11.173	-66.0
6	21	0.0000	1.5873	.9164	.2267	.2085	.1878	-91.7	-113.7	-140.3	12.315	-127.7
6	22	0.0000	1.7081	.9863	.1875	.1793	.1916	-140.1	-171.3	158.2	13.741	-169.9
6	23	0.0000	1.8290	1.0563	.1911	.2133	.2291	158.2	133.0	112.5	11.788	147.5
6	24	0.0000	1.9499	1.1262	.2297	.2282	.2076	112.4	93.7	73.5	10.397	84.8
6	25	0.0000	2.0708	1.1962	.2124	.1781	.1591	74.0	47.7	8.7	14.504	28.7
		0.0000	2.1312	1.2312		GAP 4				GAP 4	16.547	10.8
		0.0000	2.1312	1.2312	GAP 5			GAP 5			2.261	162.8
7	26	0.0000	2.1919	1.2661	.1591	.1499	.1092	8.7	12.2	11.7	3.552	-88.0
7	27	0.0000	2.3134	1.3361	.1086	.0459	.0349	9.2	-2.9	-137.5	9.790	-72.9
7	28	0.0000	2.4348	1.4060	.0356	.1030	.1546	-136.7	-155.7	-160.0	8.636	-76.6
7	29	0.0000	2.5562	1.4760	.1550	.1784	.1686	-160.0	-162.5	-164.9	1.365	-118.0
7	30	0.0000	2.6777	1.5459	.1690	.1276	.0629	-164.8	-168.3	-178.0	7.650	112.7
8	31	0.0000	2.8033	1.6184	.0631	.0289	.1035	-177.9	55.2	25.9	10.797	106.9
8	32	0.0000	2.9330	1.6932	.1036	.1605	.1838	25.9	21.0	18.2	5.447	98.6
8	33	0.0000	3.0628	1.7681	.1842	.1680	.1156	18.3	15.8	11.8	4.668	-61.0
8	34	0.0000	3.1926	1.8430	.1160	.0401	.0529	11.9	-5.0	-144.5	10.971	-70.7
8	35	0.0000	3.3224	1.9179	.0528	.1284	.1785	-144.8	-156.1	-159.2	8.471	-75.0
8	36	0.0000	3.4522	1.9928	.1792	.1911	.1613	-159.3	-160.9	-162.0	1.295	133.5
8	37	0.0000	3.5819	2.0676	.1649	.0962	.0000	-162.2	-163.2	7.1	10.908	107.8
		0.0000	0.0000	0.0000	GAP 6			GAP 6			22.433	-.9
9	38	0.0000	.0620	-.0359	.1518	.0198	.0881	92.6	160.9	-122.0	15.843	-10.0
9	39	0.0000	.1861	-.1077	.0702	.1140	.1371	-133.7	-138.3	-152.4	5.111	-80.1
9	40	0.0000	.3101	-.1795	.1388	.1511	.1638	-154.0	-173.8	162.8	7.847	-163.8
9	41	0.0000	.4342	-.2514	.1683	.1869	.2077	162.7	139.6	118.4	10.090	155.0

WIRE NO	INT NO	X' WAVE-LENGTHS	Y' WAVE-LENGTHS	Z' WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
10	42	0.0000	.5528	-.3199	.2110	.2246	.2287	118.9	101.4	84.3	9.903	109.0
10	43	0.0000	.6659	-.3852	.2310	.2243	.2112	84.7	66.8	46.2	11.068	58.2
10	44	0.0000	.7791	-.4505	.2128	.2006	.1987	46.6	22.8	-3.4	13.114	17.4
11	45	0.0000	.9048	-.5230	.1999	.2125	.2310	-2.8	-33.3	-59.6	12.904	-23.6
11	46	0.0000	1.0430	-.6026	.2317	.2390	.2303	-58.9	-82.1	-105.4	11.376	-82.6
11	47	0.0000	1.1813	-.6823	.2309	.2106	.1965	-104.8	-131.4	-163.2	13.136	-142.2
11	48	0.0000	1.3195	-.7619	.1963	.2008	.2191	-162.6	-164.1	135.1	13.457	171.4
11	49	0.0000	1.4577	-.8416	.2189	.2313	.2266	135.4	111.0	88.1	11.173	114.0
12	50	0.0000	1.5873	-.9164	.2267	.2085	.1878	88.3	66.3	39.7	12.315	52.3
12	51	0.0000	1.7081	-.9863	.1875	.1793	.1916	39.9	8.7	-21.8	13.741	-10.1
12	52	0.0000	1.8290	-1.0563	.1911	.2133	.2291	-21.8	-47.0	-67.5	11.788	-32.5
12	53	0.0000	1.9499	-1.1262	.2297	.2282	.2076	-67.6	-86.3	-106.5	10.397	-95.2
12	54	0.0000	2.0708	-1.1962	.2124	.1781	.1591	-106.0	-132.3	-171.3	14.504	-151.3
		0.0000	2.1312	-1.2312			GAP 7			GAP 7	16.547	-169.2
		0.0000	2.1312	-1.2312	GAP 8			GAP 8			2.261	-17.2
13	55	0.0000	2.1919	-1.2661	.1591	.1499	.1092	-171.3	-167.8	-168.3	3.552	92.0
13	56	0.0000	2.3134	-1.3361	.1086	.0459	.0349	-170.8	177.1	42.5	9.790	107.1
13	57	0.0000	2.4348	-1.4060	.0356	.1030	.1546	43.3	24.3	20.0	8.636	103.4
13	58	0.0000	2.5562	-1.4760	.1550	.1784	.1686	20.0	17.5	15.1	1.365	62.0
13	59	0.0000	2.6777	-1.5459	.1690	.1276	.0629	15.2	11.7	2.0	7.650	-67.3
14	60	0.0000	2.8033	-1.6184	.0631	.0289	.1035	2.1	-124.8	-154.1	10.797	-73.1
14	61	0.0000	2.9330	-1.6932	.1036	.1605	.1838	-154.1	-159.0	-161.8	5.447	-81.4
14	62	0.0000	3.0628	-1.7681	.1842	.1680	.1156	-161.7	-164.2	-168.2	4.668	119.0
14	63	0.0000	3.1926	-1.8430	.1160	.0401	.0529	-168.1	175.0	35.5	10.971	109.3
14	64	0.0000	3.3224	-1.9179	.0528	.1284	.1785	35.2	23.9	20.8	8.471	105.0
14	65	0.0000	3.4522	-1.9928	.1792	.1911	.1613	20.7	19.1	18.0	1.295	-46.5
14	66	0.0000	3.5819	-2.0676	.1649	.0962	.0000	17.8	16.8	-172.9	10.908	-72.2
		-.0000	0.0000	-.0000	GAP 9			GAP 9			16.821	-175.1
15	67	.0649	0.0000	.0303	.2243	.1560	.1316	-40.5	-11.7	20.0	13.530	-166.2
15	68	.1948	0.0000	.0909	.1292	.1124	.0908	13.6	37.6	56.1	6.017	-121.0
15	69	.3247	0.0000	.1516	.0919	.0527	.0116	54.0	69.9	-173.7	6.903	-40.9
15	70	.4546	0.0000	.2122	.0077	.0737	.1404	-162.8	-113.2	-107.7	9.382	-15.0
16	71	.5787	0.0000	.2702	.1415	.1890	.2139	-106.3	-104.0	-102.7	5.502	-5.8
16	72	.6972	0.0000	.3255	.2161	.2122	.1777	-102.2	-101.9	-102.9	2.885	170.8
16	73	.8156	0.0000	.3808	.1801	.1189	.0433	-102.7	-106.8	-131.2	10.780	175.5
17	74	.9471	0.0000	.4422	.0457	.0763	.1684	-131.0	106.8	94.5	12.696	175.2
17	75	1.0914	0.0000	.5095	.1684	.2265	.2353	95.3	91.4	88.5	4.442	162.1
17	76	1.2358	0.0000	.5769	.2369	.1924	.1058	88.9	85.1	75.0	8.536	9.7
17	77	1.3802	0.0000	.6442	.1076	.0361	.1276	75.5	-15.5	-72.7	14.141	2.8
17	78	1.5246	0.0000	.7115	.1269	.2078	.2420	-72.3	-80.1	-83.7	7.521	-5.8
18	79	1.6651	0.0000	.7771	.2425	.2226	.1559	-83.5	-86.4	-90.6	5.905	-161.1
18	80	1.8019	0.0000	.8409	.1568	.0591	.0631	-90.3	-106.2	117.7	14.097	-172.4
18	81	1.9386	0.0000	.9047	.0624	.1603	.2265	117.4	103.2	99.7	11.047	-176.8
18	82	2.0753	0.0000	.9685	.2272	.2442	.2071	99.6	97.9	96.7	1.506	37.0
18	83	2.2121	0.0000	1.0323	.2119	.1241	.0000	96.5	95.6	108.7	13.929	6.5
		.0000	0.0000	.0000	GAP 10			GAP 10			16.821	4.9
19	84	-.0649	0.0000	-.0303	.2243	.1560	.1316	139.5	168.3	-160.0	13.530	13.8
19	85	-.1948	0.0000	-.0909	.1292	.1124	.0908	-166.4	-142.4	-123.9	6.017	59.0
19	86	-.3247	0.0000	-.1516	.0919	.0527	.0116	-126.0	-110.1	6.3	6.903	139.1
19	87	-.4546	0.0000	-.2122	.0077	.0737	.1404	17.2	66.8	72.3	9.382	165.0
20	88	-.5787	0.0000	-.2702	.1415	.1890	.2139	73.7	76.0	77.3	5.502	174.2
20	89	-.6972	0.0000	-.3255	.2161	.2122	.1777	77.8	78.1	77.1	2.885	-9.2

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WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
20	90	-.8156	0.0000	-.3808	.1801	.1189	.0433	77.3	73.2	48.8	10.780	-4.5
21	91	-.9471	0.0000	-.4422	.0457	.0763	.1684	49.0	-73.2	-85.5	12.696	-4.8
21	92	-1.0914	0.0000	-.5095	.1684	.2265	.2353	-84.7	-88.6	-91.5	4.442	-17.9
21	93	-1.2358	0.0000	-.5769	.2369	.1924	.1058	-91.1	-94.9	-105.0	8.536	-170.3
21	94	-1.3802	0.0000	-.6442	.1076	.0361	.1276	-104.5	164.5	107.3	14.141	-177.2
21	95	-1.5246	0.0000	-.7115	.1269	.2078	.2420	107.7	99.9	96.3	7.521	174.2
22	96	-1.6651	0.0000	-.7771	.2425	.2226	.1559	96.5	93.6	89.4	5.905	18.9
22	97	-1.8019	0.0000	-.8409	.1568	.0591	.0631	89.7	73.8	-62.3	14.097	7.6
22	98	-1.9386	0.0000	-.9047	.0624	.1603	.2265	-62.6	-76.8	-80.3	11.047	3.2
22	99	-2.0753	0.0000	-.9685	.2272	.2442	.2071	-80.4	-82.1	-83.3	1.506	-143.0
22	100	-2.2121	0.0000	-1.0323	.2119	.1241	.0000	-83.5	-84.4	71.3	13.929	-173.5

IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	DEGREES
1	159.021	-525.117	.000528	.001744	0.000	0.000	159.021	-525.117	1000.000	0.0
2	159.021	-525.117	.000528	.001744	0.000	0.000	159.021	-525.117	1000.000	-180.0
3					INFINITE	INFINITE	-54.005	49.839	11.155	49.9
6					INFINITE	INFINITE	-54.005	49.839	11.155	-130.1
9					INFINITE	INFINITE	-.000	-.000	.000	-74.0
10					INFINITE	INFINITE	-.000	.000	.000	-74.0
4					INFINITE	INFINITE	-600.000	.000	95.488	8.7
7					INFINITE	INFINITE	-600.000	.000	95.488	-171.3

INPUT POWER = 1056.490 WATTS
RADIATED POWER = 990.726 WATTS
WIRE LOSS = .000 WATTS
NETWORK LOSS = 65.765 WATTS
RADIATION EFFICIENCY = 93.78 PER CENT

EXCITATION MODE 2

GAP SOURCES

GAP	EMF VOLT	EMF DEGREES	OHM	MICRO HENRY	PICO FARAD	
1	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES
2	1000.0000	-0.00	-0.0000	-0.0000	INFINITY	SERIES

NETWORKS UNCHANGED

		COORDINATES			CURRENT DISTRIBUTION					NORMAL ELECTRIC FIELD * RADIUS	
		X	Y	Z	AMPLITUDE			PHASE			
WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMP	AMP	AMP	DEG	DEG	VOLTS	DEG
		0.0000	0.0000	-.0000	GAP 1			GAP 1		157.376	-3.9
1	1	0.0000	0.0000	.0717	1.4801	.4456	.9907	69.4	22.5	-74.4	162.179	-6.2
1	2	0.0000	0.0000	.2151	.9298	1.7676	2.2787	-73.1	-86.4	-90.8	97.944	-12.3
1	3	0.0000	0.0000	.3585	2.2752	2.3339	1.9254	-90.9	-93.3	-94.9	26.140	-160.0
1	4	0.0000	0.0000	.5019	1.9614	1.1286	.0000	-95.0	-96.2	-98.5	135.135	175.0
		0.0000	0.0000	.0000	GAP 2			GAP 2		157.376	-3.9
2	5	0.0000	0.0000	-.0717	1.4801	.4456	.9907	69.4	22.5	-74.4	162.179	-6.2
2	6	0.0000	0.0000	-.2151	.9298	1.7676	2.2787	-73.1	-86.4	-90.8	97.944	-12.3
2	7	0.0000	0.0000	-.3585	2.2752	2.3339	1.9254	-90.9	-93.3	-94.9	26.140	-160.0
2	8	0.0000	0.0000	-.5019	1.9614	1.1286	.0000	-95.0	-96.2	-98.5	135.135	175.0
		0.0000	0.0000	0.0000	GAP 3			GAP 3		65.738	-176.9
3	9	0.0000	.0620	.0359	.6644	.3299	.2492	-115.6	-149.7	156.1	48.445	175.2
3	10	0.0000	.1861	.1077	.2268	.1962	.1991	175.1	130.3	92.1	19.509	129.4
3	11	0.0000	.3101	.1795	.1830	.1913	.2138	92.4	55.3	21.4	15.969	63.1
3	12	0.0000	.4342	.2514	.2110	.2482	.2841	19.9	-9.0	-32.5	15.739	10.4
4	13	0.0000	.5528	.3199	.2852	.3059	.3086	-33.0	-51.7	-69.8	14.182	-44.7
4	14	0.0000	.6659	.3852	.3096	.2958	.2738	-69.9	-89.3	-111.8	15.873	-100.0
4	15	0.0000	.7791	.4505	.2745	.2583	.2596	-111.7	-137.9	-165.8	18.764	-141.9
5	16	0.0000	.9048	.5230	.2598	.2816	.3035	-165.6	163.5	137.6	16.879	174.2
5	17	0.0000	1.0430	.6026	.3035	.3050	.2836	137.8	114.4	89.5	15.016	109.3
5	18	0.0000	1.1813	.6823	.2835	.2543	.2450	89.7	59.7	24.6	17.860	50.6
5	19	0.0000	1.3195	.7619	.2445	.2652	.2949	24.8	-8.7	-36.0	17.241	3.5
5	20	0.0000	1.4577	.8416	.2946	.3071	.2929	-35.9	-59.2	-82.4	14.480	-59.6
6	21	0.0000	1.5873	.9164	.2929	.2657	.2437	-82.3	-106.0	-134.9	17.056	-119.1
6	22	0.0000	1.7081	.9863	.2432	.2447	.2695	-134.7	-166.3	165.5	18.123	-159.5
6	23	0.0000	1.8290	1.0563	.2687	.2967	.3088	165.4	142.7	123.4	14.850	154.7
6	24	0.0000	1.9499	1.1262	.3092	.2960	.2600	123.3	104.7	83.3	14.116	90.0
6	25	0.0000	2.0708	1.1962	.2659	.2193	.2020	83.6	55.0	13.9	19.250	37.7
		0.0000	2.1312	1.2312			GAP 4			GAP 4	21.274	19.5
		0.0000	2.1312	1.2312	GAP 5			GAP 5			3.530	141.7

WIRE NO	INT NO	WAVE-LENGTHS	WAVE-LENGTHS	WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
7	26	0.0000	2.1919	1.2661	.2020	.2005	.1559	13.9	16.7	16.1	3.276	-83.6
7	27	0.0000	2.3134	1.3361	.1545	.0778	.0254	13.9	6.5	-118.6	12.162	-69.9
7	28	0.0000	2.4348	1.4060	.0265	.1131	.1842	-119.0	-153.7	-158.7	11.589	-74.6
7	29	0.0000	2.5562	1.4760	.1848	.2214	.2157	-158.7	-161.4	-163.8	2.506	-101.0
7	30	0.0000	2.6777	1.5459	.2160	.1689	.0899	-163.9	-167.0	-174.6	9.063	113.6
8	31	0.0000	2.8033	1.6184	.0898	.0268	.1206	-174.7	67.3	25.7	13.703	107.0
8	32	0.0000	2.9330	1.6932	.1210	.1965	.2301	25.5	20.3	17.6	7.380	99.0
8	33	0.0000	3.0628	1.7681	.2306	.2141	.1507	17.5	15.1	11.5	5.444	-61.5
8	34	0.0000	3.1926	1.8430	.1509	.0555	.0605	11.6	-1.8	-146.6	13.776	-72.2
8	35	0.0000	3.3224	1.9179	.0606	.1576	.2229	-147.1	-158.6	-161.6	10.911	-76.9
8	36	0.0000	3.4522	1.9928	.2240	.2409	.2044	-161.8	-163.4	-164.6	1.466	134.7
8	37	0.0000	3.5819	2.0676	.2089	.1224	.0000	-164.9	-165.9	3.6	13.817	105.1
		0.0000	0.0000	0.0000	GAP 6			GAP 6			65.238	-176.9
9	38	0.0000	.0620	-.0359	.6644	.3299	.2492	-115.6	-149.7	156.1	48.445	175.2
9	39	0.0000	.1861	-.1077	.2268	.1962	.1991	175.1	130.3	92.1	19.509	129.4
9	40	0.0000	.3101	-.1795	.1830	.1913	.2138	92.4	55.3	21.4	15.969	63.1
9	41	0.0000	.4342	-.2514	.2110	.2482	.2841	19.9	-9.0	-32.5	15.739	10.4
10	42	0.0000	.5528	-.3199	.2852	.3059	.3086	-33.0	-51.7	-69.8	14.182	-44.7
10	43	0.0000	.6659	-.3852	.3096	.2958	.2738	-69.9	-89.3	-111.8	15.873	-100.0
10	44	0.0000	.7791	-.4505	.2745	.2583	.2596	-111.7	-137.9	-165.8	18.264	-141.9
11	45	0.0000	.9048	-.5230	.2598	.2816	.3035	-165.6	163.5	137.6	16.879	174.2
11	46	0.0000	1.0430	-.6026	.3035	.3050	.2836	137.8	114.4	89.5	15.016	109.3
11	47	0.0000	1.1813	-.6823	.2835	.2543	.2450	89.7	59.7	24.6	17.860	50.6
11	48	0.0000	1.3195	-.7619	.2445	.2652	.2949	24.8	-8.7	-36.0	17.241	3.5
11	49	0.0000	1.4577	-.8416	.2946	.3071	.2929	-35.9	-59.2	-82.4	14.480	-59.6
12	50	0.0000	1.5873	-.9164	.2929	.2657	.2437	-82.3	-106.0	-134.9	17.056	-119.1
12	51	0.0000	1.7081	-.9863	.2432	.2447	.2695	-134.7	-166.3	165.5	18.123	-159.5
12	52	0.0000	1.8290	-1.0563	.2687	.2967	.3088	165.4	142.7	123.4	14.850	154.7
12	53	0.0000	1.9499	-1.1262	.3092	.2960	.2600	123.3	104.7	83.3	14.116	90.0
12	54	0.0000	2.0708	-1.1962	.2659	.2193	.2020	83.6	55.0	13.9	19.250	37.7
		0.0000	2.1312	-1.2312				GAP 7		GAP 7	21.274	19.5
		0.0000	2.1312	-1.2312	GAP 8			GAP 8			3.530	141.7
13	55	0.0000	2.1919	-1.2661	.2020	.2005	.1559	13.9	16.7	16.1	3.276	-83.6
13	56	0.0000	2.3134	-1.3361	.1545	.0778	.0254	13.9	6.5	-118.6	12.162	-69.9
13	57	0.0000	2.4348	-1.4060	.0265	.1131	.1842	-119.0	-153.7	-158.7	11.589	-74.6
13	58	0.0000	2.5562	-1.4760	.1848	.2214	.2157	-158.7	-161.4	-163.8	2.506	-101.0
13	59	0.0000	2.6777	-1.5459	.2160	.1689	.0899	-163.9	-167.0	-174.6	9.063	113.6
14	60	0.0000	2.8033	-1.6184	.0898	.0268	.1206	-174.7	67.3	25.7	13.703	107.0
14	61	0.0000	2.9330	-1.6932	.1210	.1965	.2301	25.5	20.3	17.6	7.380	99.0
14	62	0.0000	3.0628	-1.7681	.2306	.2141	.1507	17.5	15.1	11.5	5.444	-61.5
14	63	0.0000	3.1926	-1.8430	.1509	.0555	.0605	11.6	-1.8	-146.6	13.776	-72.2
14	64	0.0000	3.3224	-1.9179	.0606	.1576	.2229	-147.1	-158.6	-161.6	10.911	-76.9
14	65	0.0000	3.4522	-1.9928	.2240	.2409	.2044	-161.8	-163.4	-164.6	1.466	134.7
14	66	0.0000	3.5819	-2.0676	.2089	.1224	.0000	-164.9	-165.9	3.6	13.817	105.1
		0.0000	0.0000	0.0000	GAP 9			GAP 9			30.110	41.0
15	67	.0649	0.0000	.0303	.1948	.4193	.6350	-74.0	-64.3	-66.3	30.521	27.1
15	68	.1948	0.0000	.0909	.6607	.8008	.8128	-68.0	-71.2	-74.7	12.035	-11.0
15	69	.3247	0.0000	.1516	.8212	.6971	.4599	-74.9	-79.9	-89.9	27.273	-147.3
15	70	.4546	0.0000	.2122	.4646	.2028	.2917	-89.8	-128.6	144.1	46.776	-159.5
16	71	.5787	0.0000	.2702	.2900	.5304	.7073	144.5	124.7	117.2	35.236	-169.3
16	72	.6972	0.0000	.3255	.7063	.7742	.7199	117.3	112.6	108.2	8.527	119.7
16	73	.8156	0.0000	.3808	.7196	.5525	.3072	108.4	102.6	89.6	33.061	31.3

WIRE NO	INT NO	X WAVE-LENGTHS	Y WAVE-LENGTHS	Z WAVE-LENGTHS	AMPLITUDE AMP	AMP	AMP	PHASE DEG	DEG	DEG	VOLTS	DEG
17	74	.9471	0.0000	.4422	.3071	.1515	.4510	-89.9	-14.4	-55.2	45.291	20.8
17	75	1.0914	0.0000	.5095	.4498	.6816	.7524	-55.3	-63.4	-67.9	20.525	4.8
17	76	1.2358	0.0000	.5769	.7520	.6419	.3805	-67.9	-72.3	-80.8	24.413	-145.3
17	77	1.3802	0.0000	.6442	.3803	.0967	.3625	-80.5	-151.5	125.7	45.229	-157.8
17	78	1.5246	0.0000	.7115	.3621	.6316	.7525	125.4	116.9	113.0	25.417	-168.2
18	79	1.6651	0.0000	.7771	.7531	.6995	.4937	112.9	109.7	105.1	17.901	37.2
18	80	1.8019	0.0000	.8409	.4945	.1884	.2016	105.3	88.3	-45.6	44.538	23.6
18	81	1.9386	0.0000	.9047	.2004	.5101	.7190	-46.2	-61.1	-64.8	35.027	18.3
18	82	2.0753	0.0000	.9685	.7212	.7739	.6553	-65.1	-67.0	-68.3	5.033	-126.0
18	83	2.2121	0.0000	1.0323	.6693	.3910	.0000	-68.5	-69.6	81.7	43.988	-158.5
		.0000	0.0000	.0000	GAP 10			GAP 10			30.110	41.0
19	84	-.0649	0.0000	-.0303	.1948	.4193	.6350	-74.0	-64.3	-66.3	30.521	27.1
19	85	-.1948	0.0000	-.0909	.6607	.8008	.8128	-68.0	-71.2	-74.7	12.035	-11.0
19	86	-.3247	0.0000	-.1516	.8212	.6971	.4599	-74.9	-79.9	-89.9	27.273	-147.3
19	87	-.4546	0.0000	-.2122	.4646	.2028	.2917	-89.8	-128.6	144.1	46.776	-159.5
20	88	-.5787	0.0000	-.2702	.2900	.5304	.7073	144.5	124.7	117.2	35.236	-169.3
20	89	-.6972	0.0000	-.3255	.7063	.7742	.7199	117.3	112.6	108.2	8.527	119.7
20	90	-.8156	0.0000	-.3808	.7196	.5525	.3072	108.4	102.6	89.6	33.061	31.3
21	91	-.9471	0.0000	-.4422	.3071	.1515	.4510	89.9	-14.4	-55.2	45.291	20.8
21	92	-1.0914	0.0000	-.5095	.4498	.6816	.7524	-55.3	-63.4	-67.9	20.525	4.8
21	93	-1.2358	0.0000	-.5769	.7520	.6419	.3805	-67.9	-72.3	-80.8	24.413	-145.3
21	94	-1.3802	0.0000	-.6442	.3803	.0967	.3625	-80.5	-151.5	125.7	45.229	-157.8
21	95	-1.5246	0.0000	-.7115	.3621	.6316	.7525	125.4	116.9	113.0	25.417	-168.2
22	96	-1.6651	0.0000	-.7771	.7531	.6995	.4937	112.9	109.7	105.1	17.901	37.2
22	97	-1.8019	0.0000	-.8409	.4945	.1884	.2016	105.3	88.3	-45.6	44.538	23.6
22	98	-1.9386	0.0000	-.9047	.2004	.5101	.7190	-46.2	-61.1	-64.8	35.027	18.3
22	99	-2.0753	0.0000	-.9685	.7212	.7739	.6553	-65.1	-67.0	-68.3	5.033	-126.0
22	100	-2.2121	0.0000	-1.0323	.6693	.3910	.0000	-68.5	-69.6	81.7	43.988	-158.5

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IMPEDANCE DATA

GAP NO	INPUT RESIST. OHMS	INPUT REACT. OHMS	INPUT CONDUCT. MHOS	INPUT SUSCEPT. MHOS	LOAD RESIST. OHMS	LOAD REACT. OHMS	GAP RESIST. OHMS	GAP REACT. OHMS	GAP VOLTAGE VOLT	GAP VOLTAGE DEGREES
1	237.289	-632.574	.000520	.001386	0.000	0.000	237.289	-632.574	1000.000	0.0
2	237.289	-632.574	.000520	.001386	0.000	0.000	237.289	-632.574	1000.000	0.0
3					INFINITE	INFINITE	-54.005	49.839	48.825	21.7
6					INFINITE	INFINITE	-54.005	49.839	48.825	21.7
9					INFINITE	INFINITE	0.000	2311.619	450.237	16.0
10					INFINITE	INFINITE	.000	2311.619	450.237	16.0
4					INFINITE	INFINITE	-600.000	.000	121.175	13.9
7					INFINITE	INFINITE	-600.000	-.000	121.175	13.9

INPUT POWER	=	1039.701 WATTS
RADIATED POWER	=	846.456 WATTS
WIRE LOSS	=	.000 WATTS
NETWORK LOSS	=	193.245 WATTS
RADIATION EFFICIENCY	=	81.41 PER CENT